



U.S. ARMY

# FALL 2019 BUILDER SUMMIT

Day 1 – Wednesday

14 August, 2019

National Academies of Sciences, Engineering, and Medicine  
500 5th Street Northwest  
Keck Center Room 100  
Washington, DC 20001



US Army Corps  
of Engineers



DISCOVER | DEVELOP | DELIVER

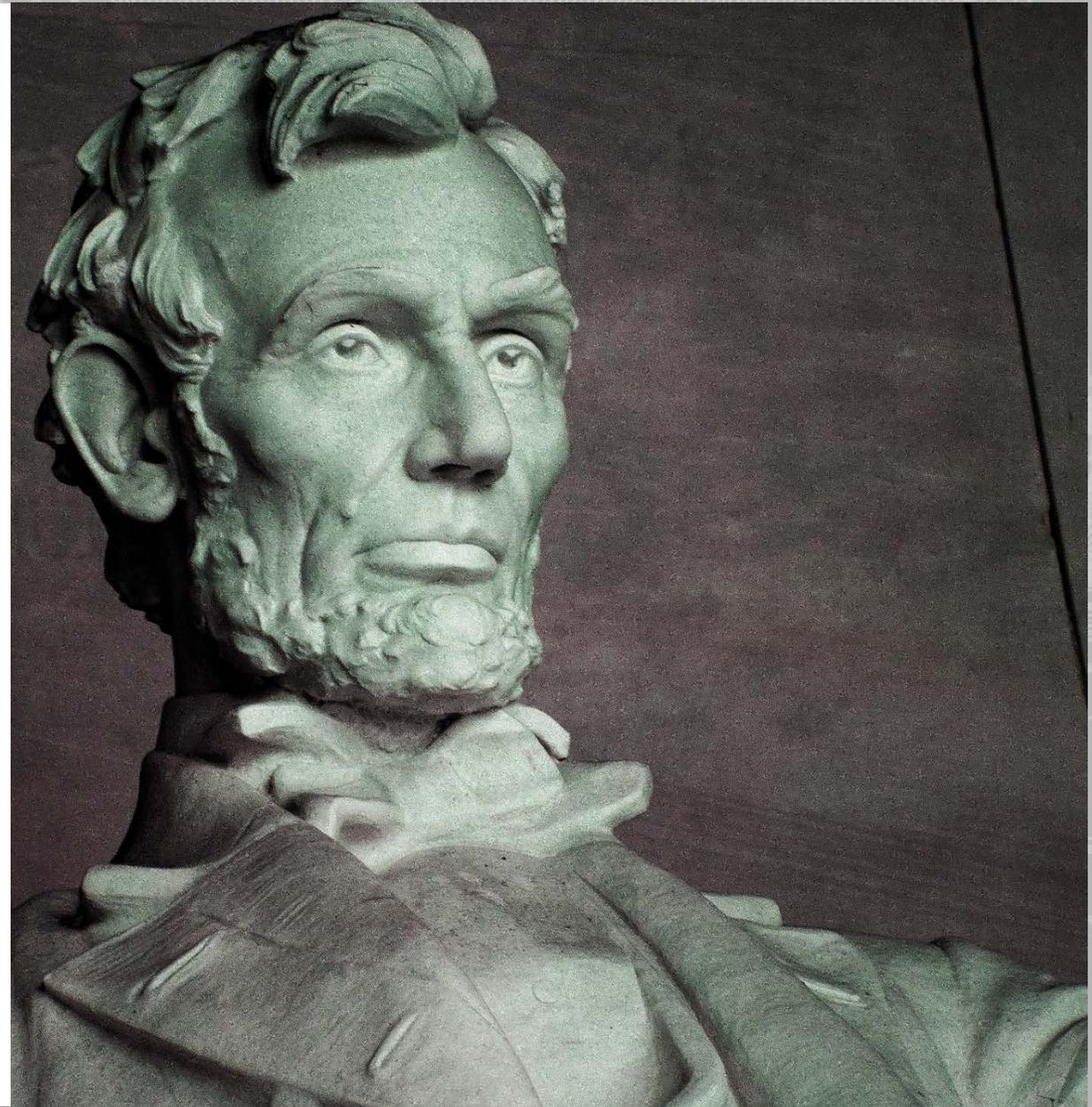
# Welcome

## **Matt Walters**

USACE ERDC-CERL Research Engineer  
Sustainment Management Systems (SMS) Project  
Manager  
OSD SMS CSP BUILDER Working Committee Chair

## **CERL-ites in Attendance:**

Dr. Lance Hansen – Director of CERL  
Lance Marrano – Director SMS TCX  
Clint Wilson – SMS Program Manager  
Christine Ansani – Research Engineer  
Rhoda Brucker – Research Engineer  
Melinda Buckrop – Research Engineer  
Mariangelica Carrasquillo-Mangual – Research Engineer  
Juan Davila-Perez – Research Engineer  
Brenda Mehnert – Research Engineer  
Ryan Smith – Research Engineer  
Matt Werth – Research Engineer



# Introduction

Welcome to the 5<sup>th</sup> BUILDER Summit!

February 2017 – 1<sup>st</sup> BUILDER Summit with BUILDER Working Committee (San Antonio, TX)

February 2018 – 2<sup>nd</sup> BUILDER Summit with BUILDER Working Committee (San Antonio, TX)

October 2018 – 3<sup>rd</sup> BUILDER Summit with BUILDER Working Committee (Wash., DC)

February 2019 – 4<sup>th</sup> BUILDER Summit with BUILDER Working Committee (San Antonio, TX)

**August 2019 – 5<sup>th</sup> BUILDER Summit with BUILDER Working Committee (Wash., DC)**

## **New This Year:**

- Additional Presenters
- Senior Service Perspectives
- Agency Case Studies
- Implementation Panel Discussion
- Structured Breakout Sessions / How-to Workshops
- No-Host Social

# Agenda Review

## Wednesday

### MORNING SESSIONS

8:00 AM—8:15 AM [Welcome Address, Introductions, and Agenda Review](#)

8:15 AM—8:45 AM [Dr. Lance Hansen – Director of CERL](#)

8:45 AM—9:30 AM [Mr. Michael McAndrew -Deputy Assistant Secretary of Defense for Facilities Management](#)

9:30 AM—9:45 AM BREAK

9:45 AM—10:15 AM [Ms. Sally Pfenning – Chief of Installation Support Division, USACE](#)

10:15 AM—10:45 AM [SMS Data Usage Cast Study – National Nuclear Security Administration \(NNSA\)](#)

10:45 AM—11:30 AM [Implementation Panel Discussion](#)

11:30 AM—1:00 PM LUNCH

### AFTERNOON SESSIONS

1:00 PM—2:00 PM [BUILDER 3.5 Retrospective/Review](#)

2:00 PM—2:15 PM BREAK

### BREAKOUT SESSIONS

*Session 1A: 2:15 PM—4:00 PM* Functionality / Work Validation and Packaging

*Session 1B: 2:15 PM—4:00 PM* BUILDER/SMS 101

*Session 1C: 2:15 PM—4:00 PM* Utilities Working Committee Meeting

# Agenda Review Cont.

## Wednesday

### MORNING SESSIONS

8:00 AM—8:30 AM [Tuesday Recap—Breakout Session Re-cap](#)

8:30 AM—9:30 AM [Enterprise SMS & VTIME Update/Demonstrations](#)

9:30 AM—9:45 AM BREAK

9:45 AM—11:00 AM [Updating BUILDER Cost Catalog – NNSA Case Study](#)

11:00 AM—11:30 AM [BUILDER Development Roadmap](#)

11:30 AM—1:00 PM LUNCH

### BREAKOUT SESSIONS

*Session 1A: 1:00 PM—2:30 PM* Intro to Using PowerBI with BUILDER Data

*Session 1B: 1:00 PM—2:30 PM* EquipMapper Data Migration Utility

*Session 1C: 1:00 PM—2:30 PM* Dams Working Committee

*2:50 PM—3:10 PM* BREAK

*Session 2A: 3:10 PM—4:00 PM* BUILDER Assessment Quality Assurance

*Session 2B: 3:10 PM—4:00 PM* Systems Integration – BUILDER API Workshop

*Session 2C: 3:10 PM—4:00 PM* IC Discussion

# *CERL Director's Welcome*

## **Dr. Lance Hansen – Director, Construction Engineering Research Laboratory U.S. Army Engineer Research and Development Center**

“Selected to the Senior Executive Service in May 2018, Dr. Lance Hansen serves as the Director of the Construction Engineering Research Laboratory (CERL), U.S. Army Engineer Research and Development Center (ERDC), Champaign, Illinois. In this capacity, Dr. Hansen leads a team of approximately 300 researchers, support staff, and contractors. He is responsible for planning, directing, and coordinating a multi-million dollar research program in installation management and design, contingency basing, construction and demolition robotics, and training enhancement technologies. ...”

### **CAREER CHRONOLOGY:**

- August 2008 – April 2018: Deputy Director, Cold Regions Research and Engineering Laboratory, U.S. Army Engineer Research and Development Center, Hanover, NH
- March 2004 – August 2008: Acting Deputy Director, Cold Regions Research and Engineering Laboratory, U.S. Army Engineer Research and Development Center, Hanover, NH
- July 2000 – February 2004: Chief, Environmental Risk Assessment Branch, Environmental Laboratory, U.S. Army Engineer Research and Development Center, Vicksburg, MS
- February 2000 – June 2000: Special Assistant, Environmental Division, Military Programs Directorate, U.S. Army Corps of Engineers, Washington D.C.
- August 1996 – January 2000: Team Leader, Biological Remediation Team, Environmental Engineering Branch, Environmental Laboratory, U.S. Army Engineer Research and Development Center, Vicksburg, MS
- December 1991 – September 1992: Assistant Operations Officer (S-3), 326th Engineer Battalion, 101st Airborne Division, Ft. Campbell, KY
- May 1991 – November 1991: Executive Officer, Alpha Company, 326th Engineer Battalion, 101st Airborne Division, Ft. Campbell, KY
- October 1988 – April 1991: Platoon Leader Alpha Company, 326th Engineer Battalion / Taskforce Engineer 3/327 Infantry, 101st Airborne Division, Ft. Campbell, KY





# CONSTRUCTION ENGINEERING RESEARCH LABORATORY

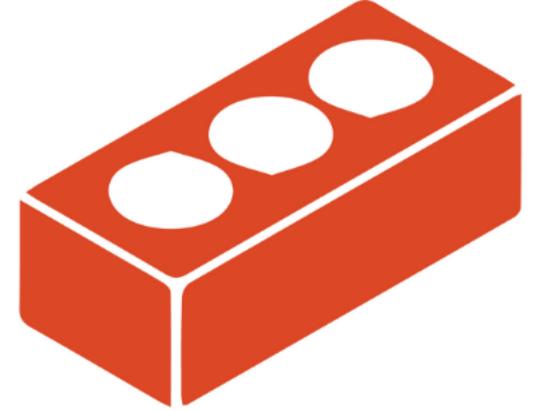
Organization Overview  
Lance Hansen, PhD



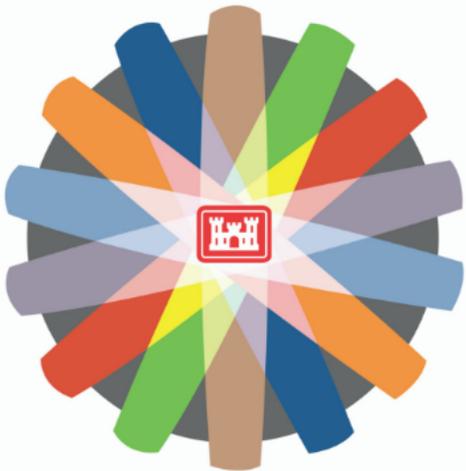
## MISSION

To increase mobility, survivability and lethality through development and deployment of Soldier tested and trained technology through all theaters.

Innovative Solutions  
Homeland | Cantonment | Contingency



**CERL**  
CONSTRUCTION ENGINEERING  
RESEARCH LABORATORY



**ERDC**  
ENGINEER RESEARCH & DEVELOPMENT CENTER

## VISION

To be a world class research and development organization that discovers, develops and delivers new ways to make the world safer and better every day.

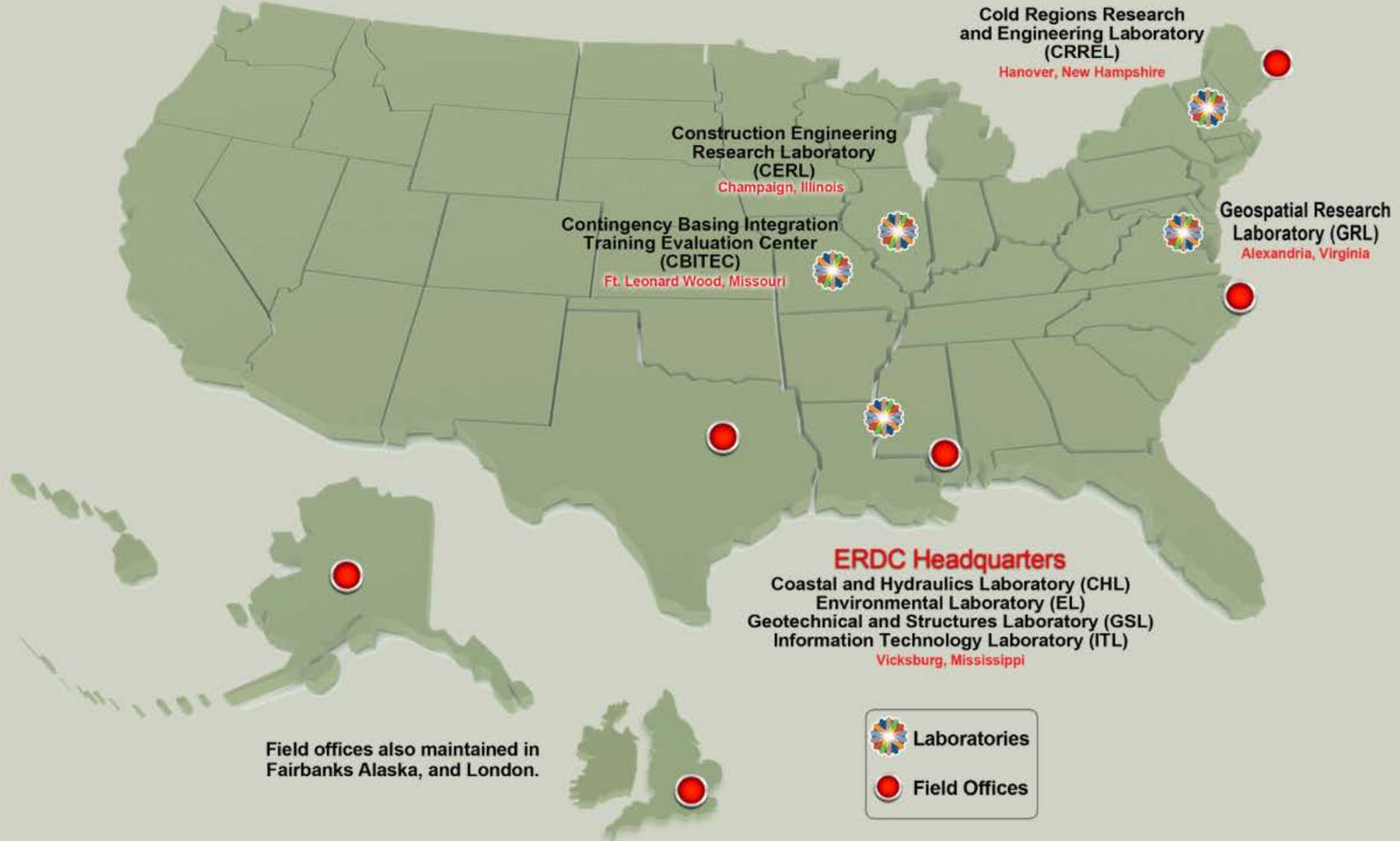
Discover | Develop | Deliver

# WHO ARE WE?

310 Strong  
58% Engineers & Scientists  
75% Advanced Degrees  
Employees in 10 states

Innovative Solutions  
Homeland | Cantonment | Contingency

# WHERE ARE WE?



# RESEARCH AREAS

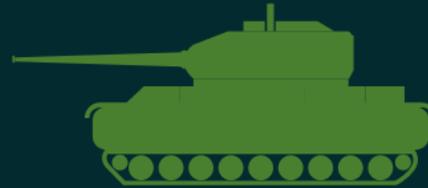
Homeland | Cantonment | Contingency



Buildings &  
Structures



Installation  
Systems



Training & Lands



Warfighter &  
Emergency  
Response  
Infrastructure

National Force | Generating Force | Operating Force



## **BUILDINGS & STRUCTURES**

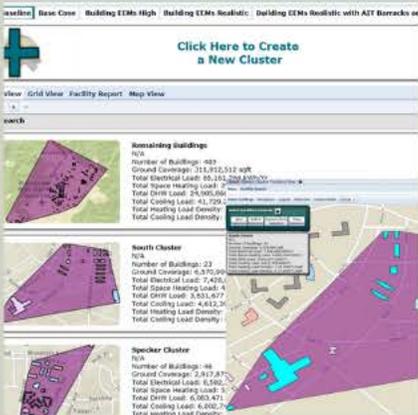
Securing our Nation's economic future through infrastructure solutions.

**Material Applications  
Paints & Coatings / Composites**

**Structural  
Analysis**

**Retro-commissioning &  
Controls**

**Construction Standards & Systems**



# INSTALLATION SYSTEMS

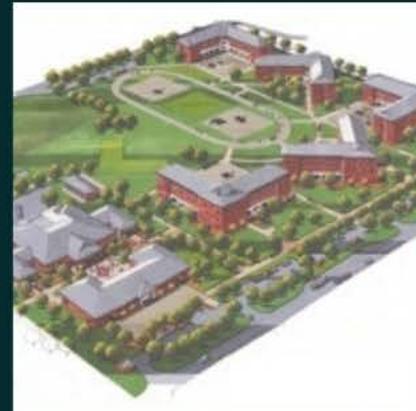
Improving mission readiness and resiliency through holistic approaches for the installation lifecycle.

Installation Planning

Installation Power & Energy

Installation Analytics

Support & Compliance





# TRAINING & LANDS

Enhancing operational readiness with sustainable solutions for installations.

Training Lands Management

Human Systems

Acoustic Impact

Cultural Resources

Threatened & Endangered Species



# WARFIGHTER & EMERGENCY RESPONSE INFRASTRUCTURE

Increase mission readiness with force multiplying technologies.

Operational Energy

Robotics

Additive Construction

Operational Water

Deployed Force Infrastructure



# PREMIERE FACILITIES



Contingency Basing  
Integration Training  
Evaluation Center (CBITEC)



ERDC - Forward Operating  
Base Laboratory (EFOB-L)



Triaxial Earthquake & Shock  
Simulator (TESS)



Paint Technology Center of  
Expertise (PTCx)



Computational Installation  
Testbed & Digital Experience  
Lab (CITADEL)



Robotics Testbed



Additive Construction & 3D  
Printing Lab



Chemistry & Synthetic  
Biology Lab

# PARTNERSHIPS FOR INNOVATION

Partnering with government, academia, and industry leaders to leverage capabilities for rapid development, test, and evaluation.



## GOVERNMENT

Environmental Protection  
Agency

US Department of  
Transportation

US Department of the Interior  
Defense Logistics Agency  
Army Futures Command



## ACADEMIA

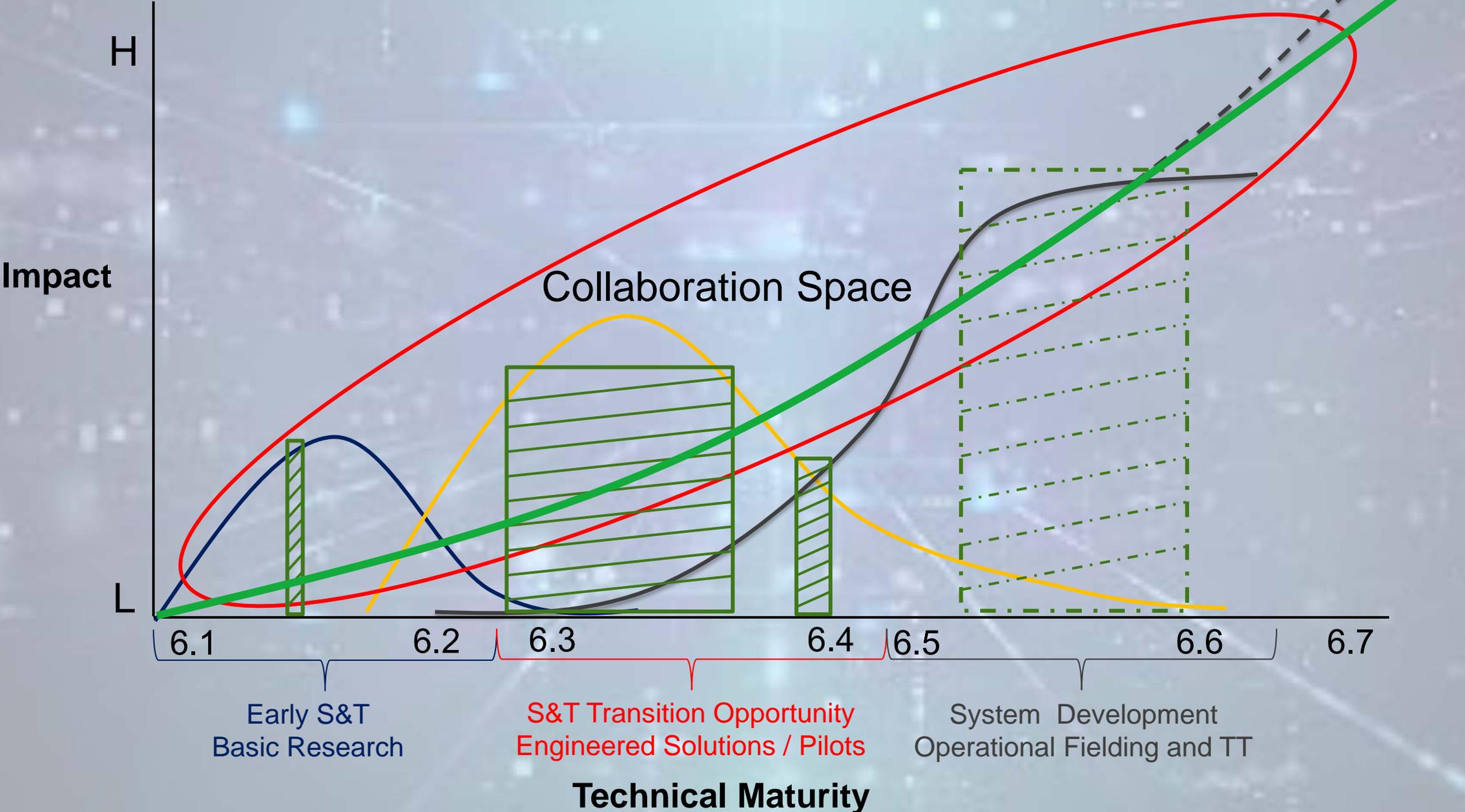
University of Illinois  
Colorado State  
Arizona State  
University of Puerto  
Rico - Mayaguez  
Temple  
Penn State



## INDUSTRY

Caterpillar  
Coltec Industries  
Gas Technologies  
Institute  
National Institute of  
Building Sciences  
Guild BioSciences

# OUR RESEARCH PHILOSOPHY





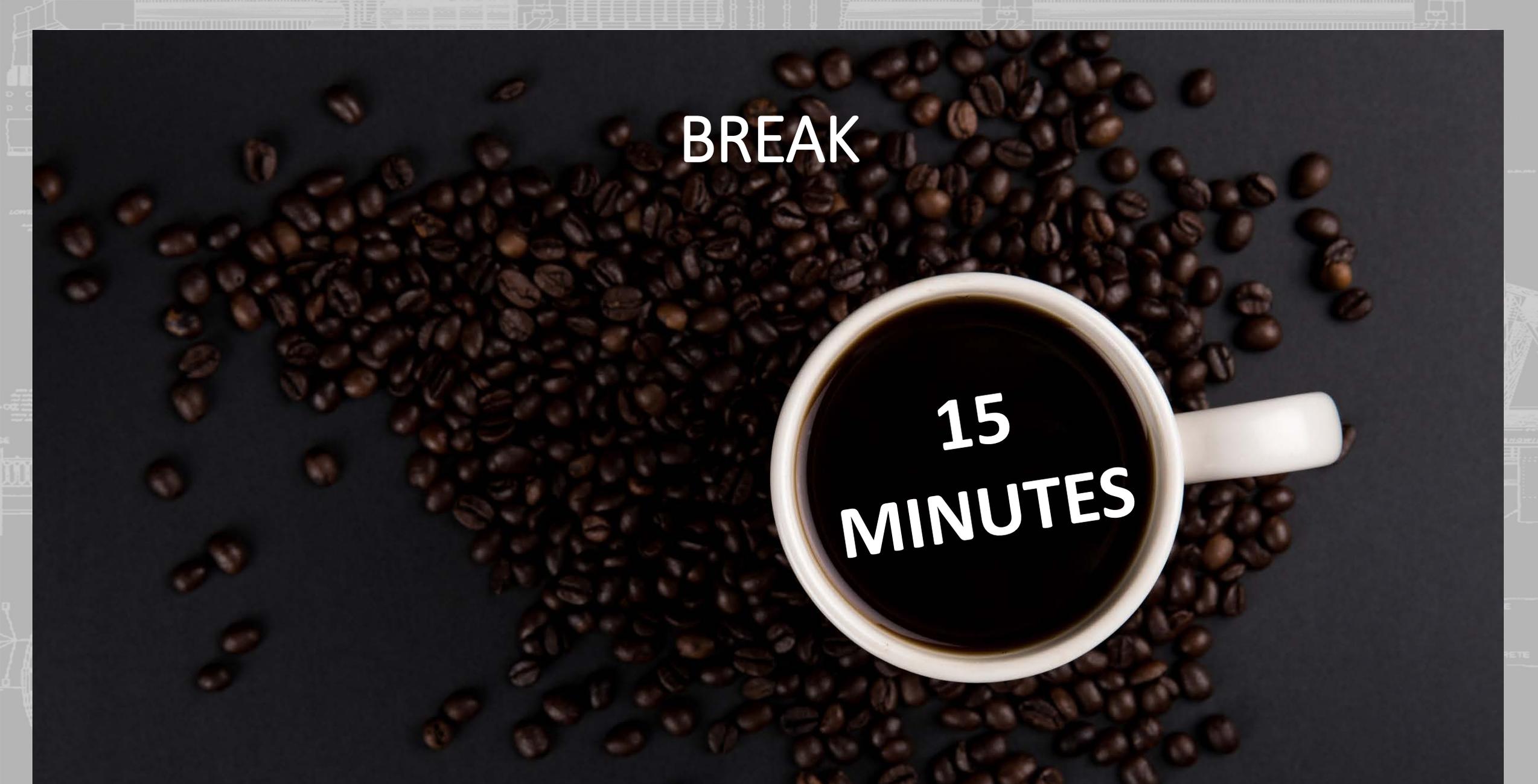
**QUESTIONS?**

# *Senior Leader Perspectives*

## **Mr. Michael McAndrew – Deputy Assistant Secretary of Defense for Facilities Management**

Mr. Michael McAndrew is the Deputy Assistant Secretary of Defense for Facilities Management within the Office of the Assistant Secretary of Defense (Sustainment). He provides executive leadership on all matters pertaining to DoD's physical infrastructure, to include development and execution of policies, guidance, and procedures for construction, operations, maintenance and repair of DoD's worldwide facilities to enhance and preserve warfighting capabilities, and provide safe working and living conditions for our military personnel and families. His responsibilities include all matters related to the unaccompanied and family housing programs; Military Housing Privatization Initiative; real property maintenance; facility operations; and host-nation programs related to facility construction and management.





**BREAK**

**15  
MINUTES**

# Senior Leader Perspectives

## Ms. Sally Pfenning – Chief of Installation Support Division US Army Corps of Engineers

“Ms. Sally G. Pfenning was selected for Senior Executive Service in September 2018, as the Chief of Installation Support Division for US Army Corps of Engineers (USACE). In this position she works to provide solutions in support of America’s Installations by expanding the technical expertise of members of the DoD engineering community and effectively applying USACE capabilities, contract capacities and other tools required to operate, maintain, sustain, restore and modernize America’s military infrastructure and real property assets. ...”

### CAREER CHRONOLOGY:

- Oct 2018 – Present: Chief Installation Support Division, Headquarters US Army Corps of Engineers
- Oct 2017 – Sep 2018: Deputy Assistant Chief of Staff for Installation Management Europe- G4
- Jan 2017 – Sep 2017: Deputy to the Garrison Commander, US Army Garrison Hawaii (Detail)
- Aug 2015 – Dec 2017: Director of Public Works, US Army Garrison, Hawaii
- Sep 2013 – Jul 2015: Deputy Director of Public Works, US Army Garrison Hawaii
- Jul 2010 – Aug 2013: Strategic Planner/Engineer/Legislative Assistant, Headquarters US Army Corps of Engineers, Washington, DC
- Jul 2009 – Jun 2010: Chief of Operations and Maintenance, US Army Garrison Kaiserslautern
- Apr 2003 – Jun 2009: Chief of Master Planning/Strategic Planner, US Army Garrison Baden Wuerttemberg, Germany
- Jul 1995-Feb 2003: Engineer Trainee/Engineer Intern/Planning Technical Leader, Jacksonville District US Army Corps of Engineers, Jacksonville, FL





U.S. DEPARTMENT OF  
**ENERGY**



# EXECUTIVE LEVEL SMS DATA USAGE

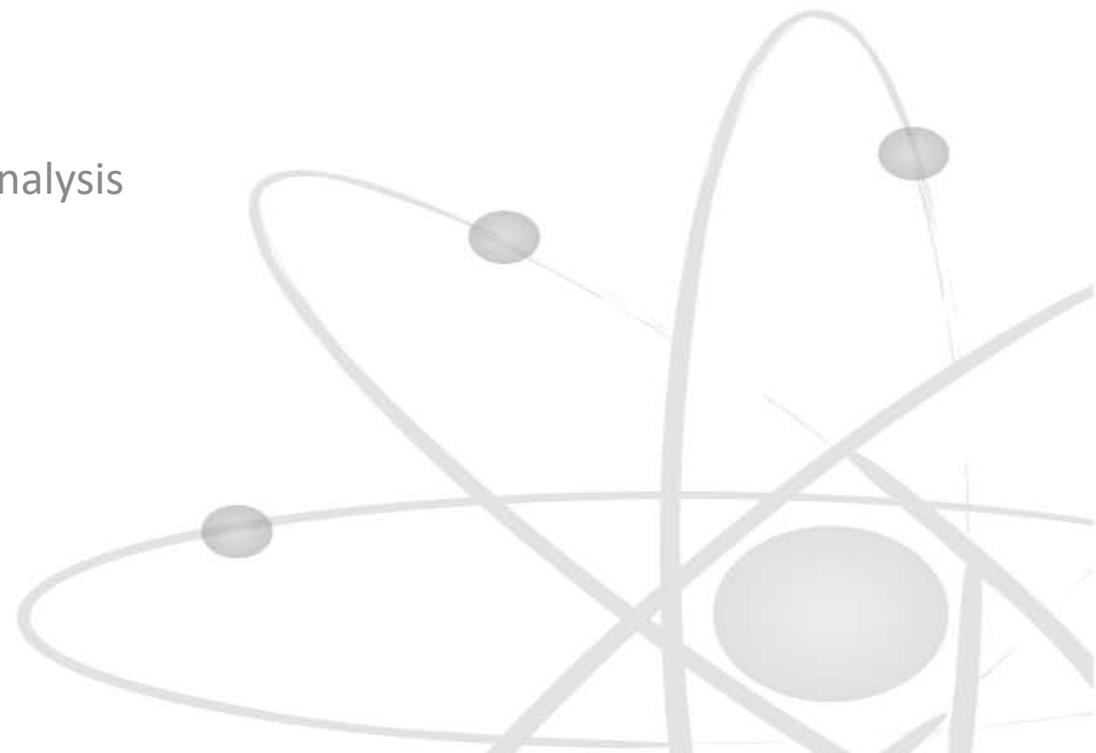
Ty C. Deschamp

Deputy Director, Office of Infrastructure Planning & Analysis

National Nuclear Security Administration

BUILDER Summit

August 14, 2019



## Nuclear Posture Review

“Over the past several decades, the U.S. nuclear weapons infrastructure has suffered the effects of **age and underfunding.**”

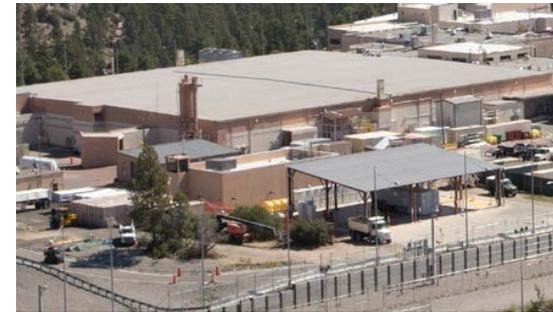
“...the United States has fallen short in sustaining a modern infrastructure that is resilient and has the capacity to respond to unforeseen developments. There now is **no margin for further delay in recapitalizing the physical infrastructure** needed to produce strategic materials and components for U.S. nuclear weapons.”

NNSA is implementing several new concepts to modernize our facilities that are beginning to achieve results

1. **Science-Based Infrastructure Stewardship Tools**
2. **Planning**
3. Centralized Procurements
4. Standardization
5. **Metrics**
6. **Increased Resources**

NNSA's Office of Infrastructure ensures that **mission enabling facilities** are safely operated, effectively managed, and adequately maintained to meet mission needs.

- **Production and Scientific Facilities**
  - Safety Systems (e.g. fire suppression, criticality and radiation alarms)
  - Environmental Controls (e.g. HVAC, ventilation)
  - Building Shell (e.g. roofs, ceilings, floors)
  
- **Balance of Plant Support Facilities**
  - Office and Lab Space
  - Land, Roads, & Parking
  - Site Utilities
  - Emergency Services
  - Waste Management



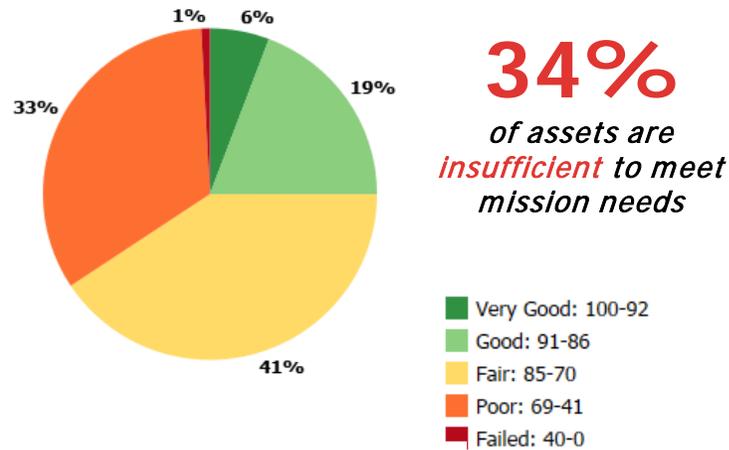
PF-4



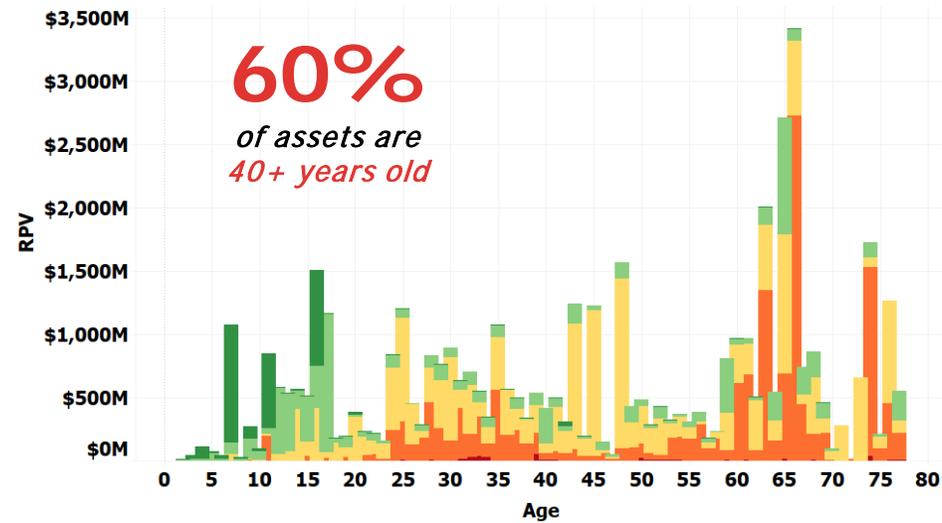
SNL Elevated Tanks

There is **no margin for further delay** in recapitalizing the physical infrastructure needed to produce strategic materials and components for U.S. nuclear weapons.  
*-2018 Nuclear Posture Review*

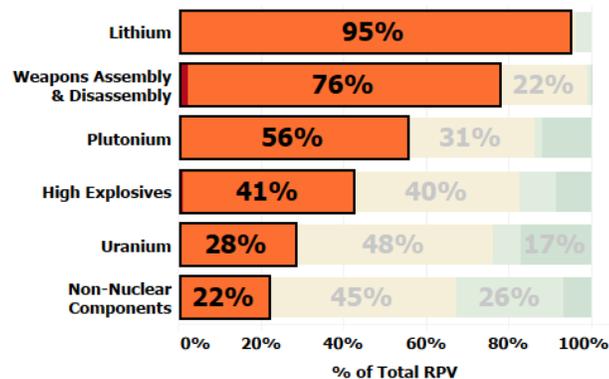
Asset Condition by Replacement Plant Value



Asset Condition by Age



Key Asset Capabilities in Insufficient Condition



### Capacity

- **Plutonium:** provide infrastructure to produce at least 80 pits per year by 2030
- **Manufacturing:** expand space for component manufacturing
- **Office and Lab Space:** meet growing needs of designers, engineers, etc.

A **science-based infrastructure stewardship** approach using risk-based, data-driven metrics to prioritize investments in order to enable the mission.

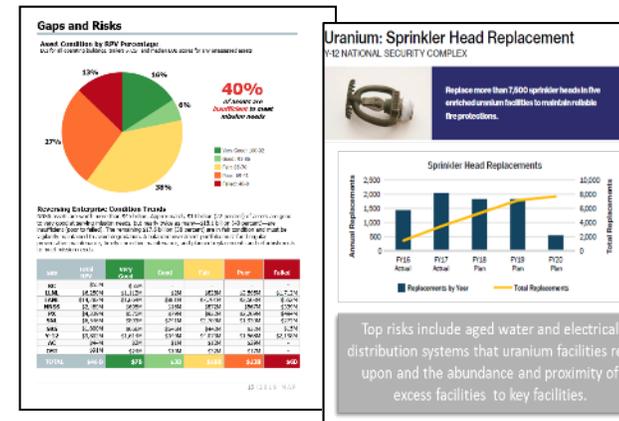
- Tools**

- BUILDER
- Mission Dependency Index (MDI)
- Enterprise Risk Management
- Excess-Facility Risk Index
- G2 Program Management System
- Prioritization Methodologies

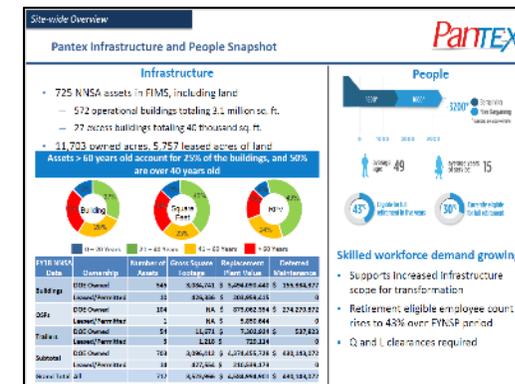
- Planning**

- Strategic Integrated Roadmap
- SSMP Chapter 4
- **Master Asset Plan (MAP)**
- Deep Dives
- CapAx
- Area Plans
- Disposition Strategic Plan

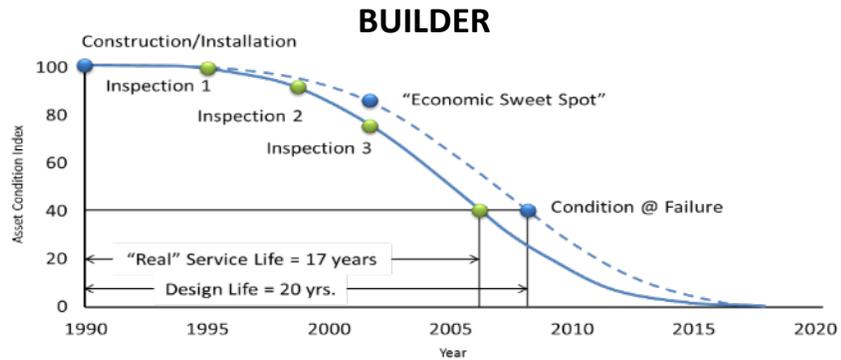
## Master Asset Plan



## Deep Dives



A **science-based infrastructure stewardship** approach using risk-based, data-driven metrics to prioritize investments in order to enable the mission.



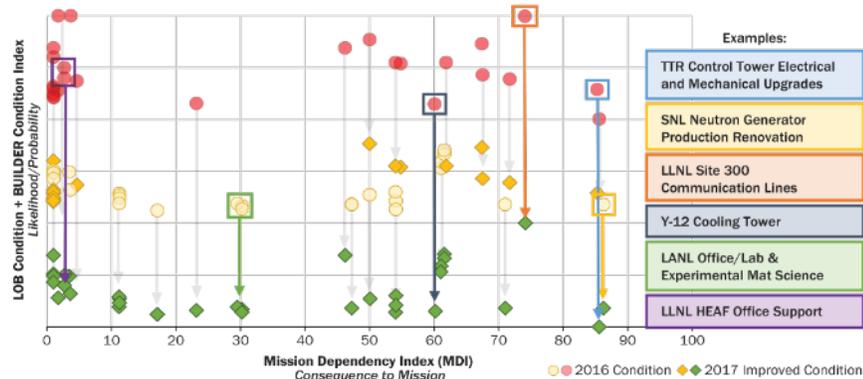
Measures likelihood of losing a facility

### Mission Dependency Index

MDI	Site	Building	Asset Name	Condition	Haz	RPV	GSF	Age
100	Y-12	9212	Production	62	2	\$973.3M	442.3k	74
82	Y-12	9201-05W	Alpha 5 West	86	R	\$97.6M	70.0k	52
62	Y-12	9998	Production	84	2	\$212.1M	152.1k	65
34	Y-12	9996	DU Binary	88	2	\$41.7M	42.2k	69
14	Y-12	5 Assets	Change Houses	85	2	\$49.3M	75.6k	36

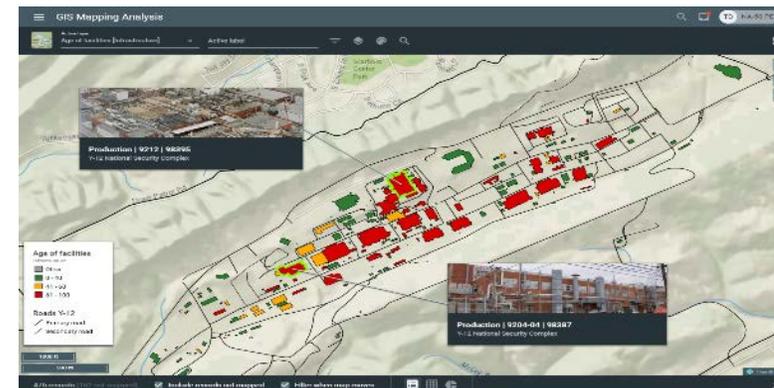
Measures mission impact if a facility is lost

### Enterprise Risk Management (ERM)



Highlights the risk posed by each asset and risk trending across the enterprise

### G2



Award-winning program management system and Program Management Plan (PMP)

NNSA's goal is to improve the **accuracy, timeliness, and consistency** of key metrics such as Replacement Plant Value (RPV), Deferred Maintenance (DM), and Repair Needs (RN).

## Current Process

-  Lack of transparency below the building level (the failed system's details are not readily available)
-  Poor timeliness (5-year assessment cycle)
-  Inconsistencies (processes for assessment of conditions, calculation of RPV/DM/RN, and setting priorities varies from site to site across NNSA)

## BUILDER Process

-  Transparency at the component level (This is 4 levels below the building level; the failed system's details are available)
-  Data updates are real-time from the site's CMMS and condition can be predicted into the future
-  Consistent NNSA-wide process for assessing condition, calculating RPV/DM/RN, and setting investment priorities

MDI allows NNSA to **rank the mission impact of each building** based on its difficulty to replace, time to mission impact, and interdependency of other buildings.

- **Q1: How difficult would it be to replace the functions with a viable alternative**
  - Extremely Difficult (>\$750M)
  - Difficult (\$200M-\$750M)
  - Challenging (\$20M-\$200M)
  - Reasonable (<\$20M)
- **Q2: How long until the NNSA mission is seriously impacted**
  - Immediate (<1 Year)
  - Near-Term (1-2 Years)
  - Long-Term (>2 Years)
  - Minimal
- **Q3: What other facilities would be seriously impacted by the loss of this facility; and how long until that facility is impacted**

G2 program management system allows NNSA to track **scope, cost, schedule, and risk data** in an automated, standardized manner under change control.

**Asset Edit**

36-1794 (N007603) - RSL Andrews Hangar 2

**Asset Details**

Property Name: 36-1794  
 Site Number: 09024  
 Site Name: Andrews AFB  
 RPLUID: 137396  
 Alt. Name: RSL Andrews Hangar 2  
 Mission Dep. Prop: Remote Sensing Laboratory (RSL) - Andrews  
 Property Type: NNSA  
 Mission Category: Remote Sensing Laboratory (RSL) - Andrews  
 HQ Program Office: NNSA  
 Contamination Category: 19  
 BCI: 100  
 BPI: 100  
 Usage Code: G03 HELICOPTER AND AIRPLANE HANGARS  
 Facility Description:  
 Size: 20,459 sq ft  
 Year Built:  
 Excess to Site Date:  
 FMS Excess Date:

**Operating Status:** Active/Full Operations  
**Area Number:** 001  
**Area Name:** Andrews AFB  
**Property ID:** N007603  
**RPV:**  
**Mission Dependency:** Mission Dependent, Not Critical  
**Utilization:** 100%  
**MDI Score:** 36  
**Ownership:** Federal Permit (P)  
**LOB Overall Asset Condition:** Substandard  
**Historic Designation:** Not Evaluated  
**CIS Footprint:** [Edit Footprint](#)

**No Dependent Assets:**  
 There are no common names to display.  
**Contacts:**  
 There are no contacts to display.  
**Order capabilities and dependent assets from highest to lowest:**  
**Capabilities (Reorder by dragging and dropping)**  
 1 Support of Other Mission / Program Capability  
 2 Pinpoint  
 3 Counterterrorism & Counter-Drift/Jarvis  
 4 Security  
 5 Strategic Partnership Projects  
**Dependent Assets (Reorder by dragging and dropping)**  
 1 Las Vegas I R-51 | 2164291 | 90770  
 2 Nevada National Security Site | 232-111 | 993320 | 112  
 3 Las Vegas I A-12 | 2322234 | 90758

**Details** | **Tasks** | **Lifecycle Budget** | **Spend Plan**

Filter Tasks: Requests Requiring My Attention | Modified | Current FY | Future FY 2020 | Completed | AI

**Expand All | Collapse All**

**Tasks**

No Site

[Expand](#) | [Collapse](#) | [Long Load Equipment](#)

[Expand](#) | [Collapse](#) | [Long Load Equipment](#) | [Modified Task](#)

**Change Request Workflow**

This change request is currently at level 2 (awaiting PROJ APP1, PROJ APP2 action). Active since today

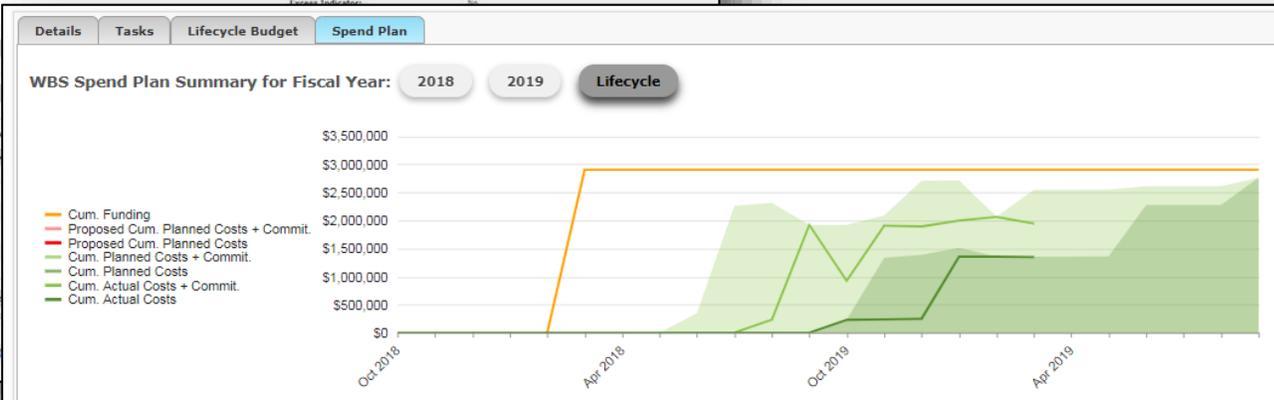
**Task Details**

Task: Execution - Long Load Equipment  
 Well Performer: KX

Milestone	Weight	Baseline Date	Forecast Date
Project Acquisition Complete [ID: 315457]	0%	9/25/2018	3/31/2019
Project Mobilization Start [ID: 315458]	0%	3/1/2019	12/31/2018 A
Project Execution 50% Complete [ID: 315455]	0%	6/22/2019	9/30/2019
Project Complete * [ID: 315454]	0%	9/29/2019	11/30/2019
Project Closeout [ID: 315456]	0%	4/12/2020	1/31/2020
Project / Milestone			
		Baseline Value	Forecast Value
		1	1

Last modified on 4/29/2019 by John Rivler

**WBS Spend Plan Summary for Fiscal Year:** 2018 | 2019 | **Lifecycle**



**Lifecycle Summary**

	2018	2019	Lifecycle
Cum. Funding	\$2,900,000.00		\$2,900,000.00
Available Balance	\$953,924.09		\$953,924.09
Cum. Planned Costs		\$2,758,077.24	\$2,758,077.24
Cum. Planned Commit.		\$0.00	\$0.00
Cum. Planned Costs + Commit.		\$2,758,077.24	\$2,758,077.24
Cum. Actual Costs		\$1,348,663.37	\$1,348,663.37
Cum. Actual Commit.		\$597,412.54	\$597,412.54
Cum. Actual Costs + Commit.		\$1,946,075.91	\$1,946,075.91

A science-based infrastructure stewardship approach using risk-based, data-driven metrics to **prioritize investments in order to enable the mission.**

## Mission Dependency Index (MDI)

LANL Facilities



EOC  
MDI 47



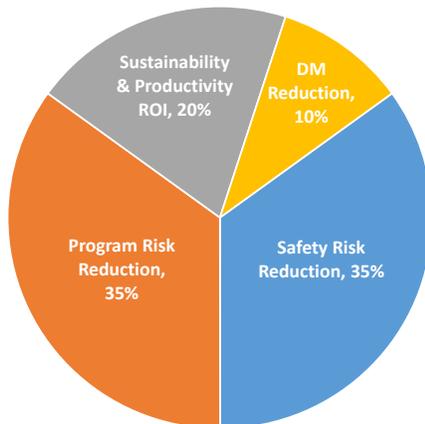
DARHT  
MDI 99



Otowi Building (Office Space)  
MDI 13

## Maintenance Prioritization MDI & BUILDER Standards & Policies

Standard		Policy	
Level	CI	MDI	Building System
Very High	90	40-100	Fire Protection
		1-39	Fire Protection
High	80	75-100	Conveying
		75-100	Roof
Medium	70	1-74	Roof
		40-74	Conveying
Low/Default	60	1-39	Conveying
No repair/End of Life	0	1-100	Basement Construction



## Recapitalization Prioritization

Infrastructure Planning Scenario Modeling

FY19 Recapitalization

Priority: [Dropdown] Funding Scenario: 3 - \$200M/year

Priority	Site	Project	Earliest Start FY	Est. End FY	Funding Year	2018	2019	2020	2021	2022
1	V-12	V-12 - Bldg. #204-2 Kathabar #1 Sump Replacement	2019	2019	2019		\$2,000,000			
2	NRES	U14 Lightning Protection Upgrades	2019	2019	2019		\$2,000,000			
3	PX	PX - Building 12-37 Secondary Electrical Feed Installation	2017	2021	2019		\$14,000,000			
4	V-12	V-12 - Bldg. #959 Supply Fan #13 Refurbishment	2018	2019	2019		\$400,000			
5	SNL	NH Tech Area 1, Roads, V Ave Extension from Gate 17 to 9th St, Installation	2019	2019	2019		\$600,000			
6	SRES	SRES 234-H 480 Volt cable replacement	2019	2020	2019		\$5,000,000			
7	KC	Bldg 2 & 3 Rubber and Plastics Manufacturing and Applications Equipment Upgrades	2015	2020	2019		\$2,900,000			
8	LLNL	R238 Chemistry Laboratories and Facility Refurbishment	2019	2020	2019		\$11,400,000			
9	V-12	V-12 - Bldg. #201-SW A1-91 HVAC Refurbishment	2019	2019	2019		\$4,700,000			
10	KC	Bldg 2 & 3 Specialty Fabrication and Assembly Applications Equipment Upgrades	2015	2020	2019		\$2,475,000			
11	NRES	Honors Utility Upgrades - Campus	2019	2020	2019		\$7,000,000			
12	SNL	SNL/CA Data Center Replacement Facility	2018	2019	2019		\$5,700,000			
13	KC	Bldg 2 & 3 Non-destructive Testing Equipment Replacement and Upgrades	2017	2017	2019		\$2,499,838			
14	KC	Building and Infrastructure Alterations for Rubber and Plastics Equipment Upgrade Efforts	2015	2020	2019		\$1,777,714			
15	V-12	V-12 - Bldg. #204-02 50 Year Sprinkler Head Replacement (Wat Pipe System 005)	2018	2019	2019		\$3,900,000			
16	PX	PX - Building 12-31 HVAC and OH Replacement	2017	2021	2019		\$7,000,000			

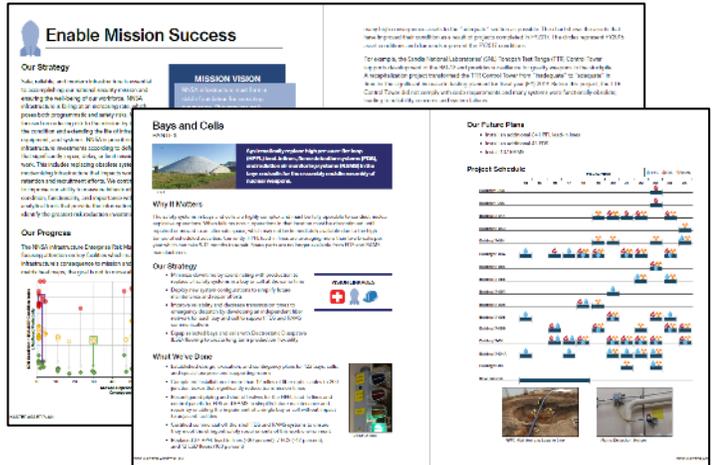
NNSA is using our **new tools to develop strategic and area plans** in order to drive prioritized, integrated infrastructure investments across the enterprise.

- **Prioritizing investments** with the greatest impact on mission via new tools
- Conducting **Deep Dives** at each site to better understand the long-term, requirements-based needs
- Publishing an annual **Master Asset Plan (MAP)** which is the integrated, NNSA-wide infrastructure strategic plan
- Developing detailed **Area Plans** to synchronize Maintenance, Recapitalization, Line-Item, and Leasing investments
- Increasing emphasis on timely **Disposition** of excess facilities to reduce mission risk, unencumber valuable site real estate, and save cost
- Emphasizing greater **project-level** planning prior to submission on funding

NNSA is using our new tools and authorities to develop strategic and area plans in order to drive **prioritized, integrated infrastructure investments** across the enterprise.

- A robust and integrated NNSA-wide infrastructure strategic planning process to create a risk-informed, long-range Master Asset Plan (MAP).
- The MAP is informed by biennial deep dives conducted at each NNSA site, which:
  - Identify the mission requirements for infrastructure readiness;
  - Discuss current infrastructure condition, functionality, gaps, and risks; and
  - Prioritize infrastructure investments needed to close gaps and reduce risk.

## 2018 MAP



**Enable Mission Success**

**Our Strategy**

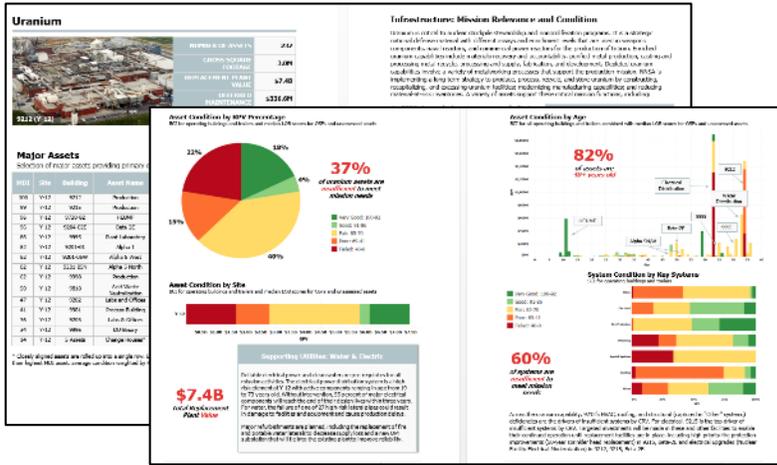
**MISSION VISION**

**Bayes and Cells**

**Our Future Plans**

**Project Schedule**

## 2019 MAP



**Uranium**

**Infrastructure Mission Relevance and Condition**

**Asset Condition by Site**

**Asset Condition by Age**

**System Condition by Key Systems**

**Major Assets**

**Asset Condition by Age**

**Asset Condition by Site**

**Asset Condition by Age**

**System Condition by Key Systems**

Track **scope, cost, schedule, and risk data** in an automated, standardized manner under change control.

A4.2 LAWRENCE LIVERMORE NATIONAL LABORATORY

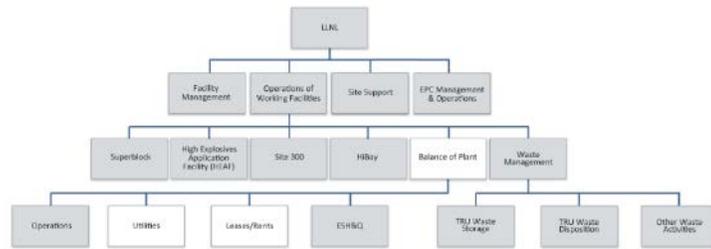
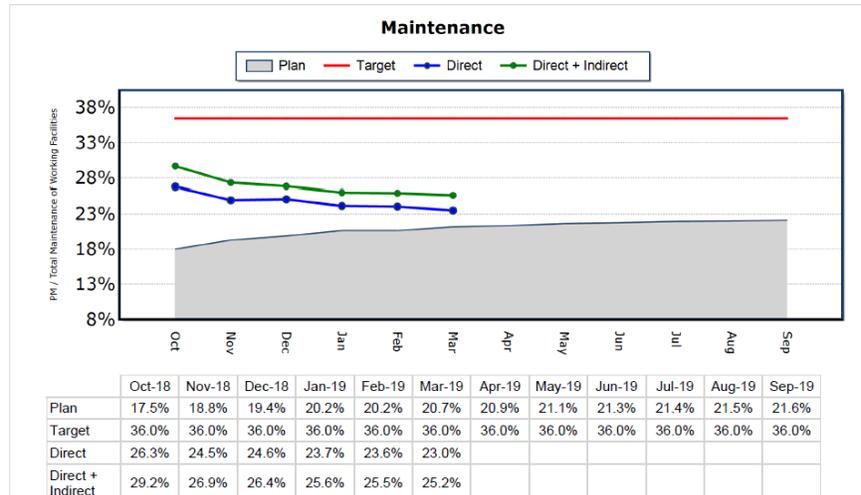


Figure 39: LLNL Operations Groups of Facilities WBS

NA-50 Executive Summary Report  
FY2019 Executive Metrics

Costs thru: March FY2019; Funding thru: March FY2019; Schedule thru: March FY2019



Portfolio: LLNL - Bldg 151 Hood Replacements in Radiochemistry Laboratories Portfolio (50.3.109)  
**LLNL - B151 High Level Radiochemistry Gloveboxes Lab Revitalizations: 1033, 1034, 1034A-C (50.3.109.2)**  
 Primary Site: LLNL  
 Work Type: Minor Construction; Other  
 Costs thru: March FY2019; Funding thru: March FY2019; Schedule thru: March FY2019

Lifecycle Budget			FY19 Performance Summary					
	Baseline	Funding	Cost	Variance	Est EOY C/O	-30.0%	0	30.0%
FY18	\$700	\$700	\$0					
FY19	\$7,100	\$7,100	\$485					
<b>Total</b>	<b>\$7,800</b>	<b>\$7,800</b>	<b>\$485</b>					

C/O	Plan	Actual	C+O	Total	EOY	C+O	Total	EOY
	\$341	\$151	(\$136)					
	\$492	144.3%/44.3%	(1.7%)					
	\$341	\$143	\$4,175					
	\$485	142.1%/42.1%	53.5%					



**FY19 Financial Details**

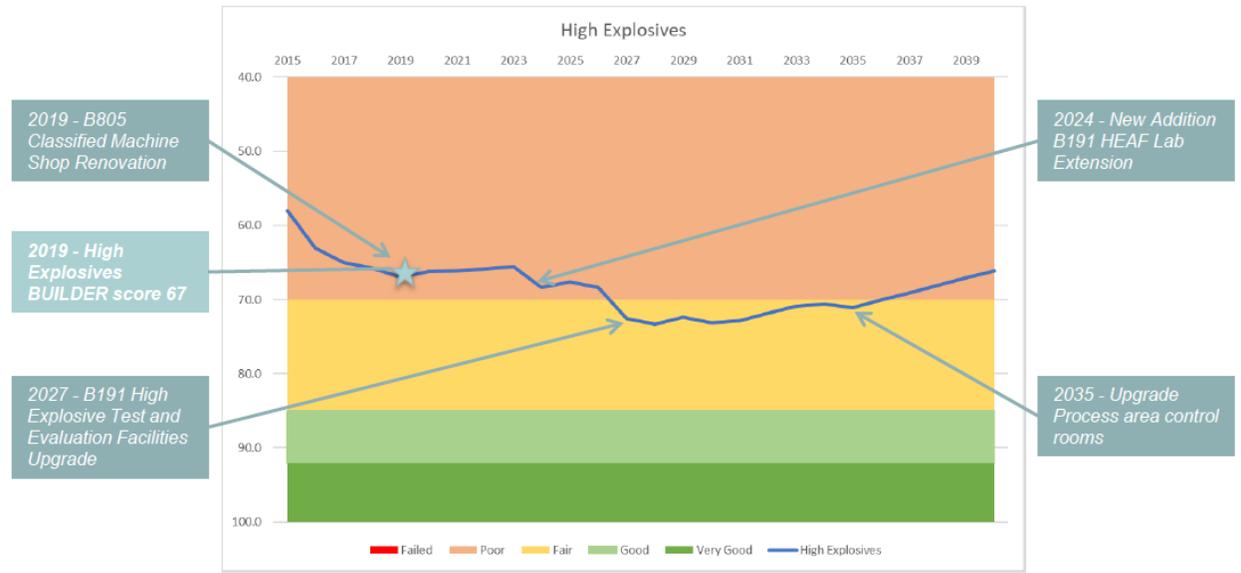
Performer(s)	C/O	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Total	
LLNL	Funding	\$700	\$7,100	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,800	
	Com	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$130	\$3,899	(\$402)	(\$235)	\$2,947	
	Cost	\$0	\$85	\$24	\$95	\$100	\$45	\$36	\$207	\$125	\$390	\$978	\$773	\$540	\$2,552
	Act	\$0	\$85	\$12	(\$11)	\$5	(\$11)	(\$9)							\$8
	Cost	\$0	\$85	\$24	\$87	\$74	\$101	\$115							\$485
	Funding	\$700	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800	\$7,800						\$7,800
Cumulative	Plan	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$130	\$4,037	\$3,804	\$3,370	\$2,947	
	Cost	\$0	\$85	\$109	\$104	\$104	\$305	\$341	\$540	\$674	\$1,083	\$1,839	\$2,051	\$2,552	
	Act	\$0	\$8	\$30	\$9	\$14	\$13	\$8	\$8					\$8	
Uncommitted/Available	\$700	\$7,707	\$7,811	\$7,805	\$7,817	\$7,817	\$7,817	\$7,817						\$7,308	

**Lifecycle Schedule Details**

WBS/Task/Milestone	Metric	Baseline	February Forecast	March Forecast	Days Slipped
<b>Design (50.3.109.2.2)</b>					
Project Start (ID: 323414)		9/4/2018	9/4/2018	9/4/2018 A	0
Submit Project Execution Plan (ID: 323413)		1/14/2019	1/24/2019	1/24/2019 A	-8
Design Complete (ID: 323412)		12/24/2018	2/15/2019	2/15/2019 A	-39
Task Status: (Last Modified on 3/4/2019 by Malani Hibbard); 3/1/2019: Design completed in-house					
<b>Execution (50.3.109.2.1)</b>					
Project Acquisition Complete (ID: 323415)		4/8/2019	5/17/2019	5/17/2019	-29
Project Mobilization Start (ID: 323418)		5/6/2019	6/14/2019	6/14/2019	-29
Project Execution 50% Complete (ID: 323419)		10/17/2019	11/15/2019	11/15/2019	-21
Project Complete (ID: 323417)	PMN/Scope	3/9/2020	4/17/2020	4/17/2020	-29
Project Closeout (ID: 323416)		6/1/2020	8/17/2020	8/17/2020	-55
Task Status: (Last Modified on 4/4/2019 by Kaitlyn Covello); 4/2/2019: Waste characterization continues by lab personnel; three additional areas of contamination found but are now being abated					

Track **scope, cost, schedule, and risk data** in an automated, standardized manner under change control.

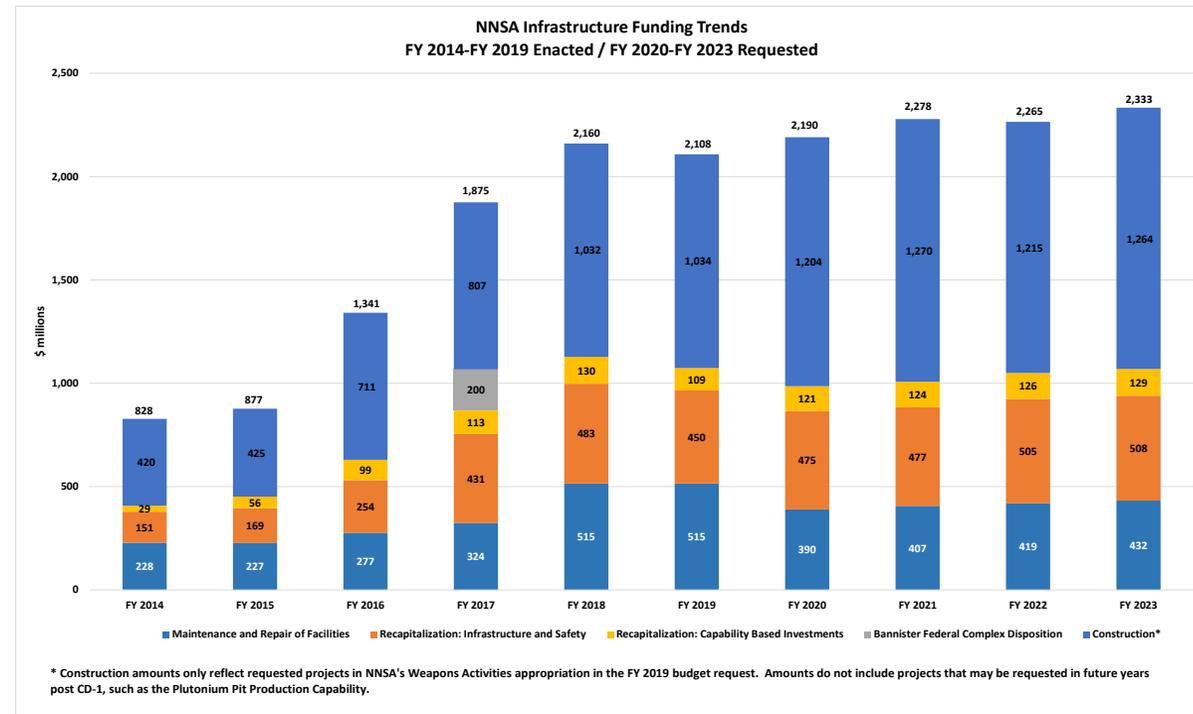
## RISK REDUCTION



- Over the next 20 years, B191 High Explosive Test and Evaluation Facilities Upgrade, New Addition B191 HEAF Lab Extension, and S300 recapitalization investments will keep LLNL high explosive capabilities in fair condition.
- Beyond FY2040 significant investment at both S300 and the HEAF facility will be required.

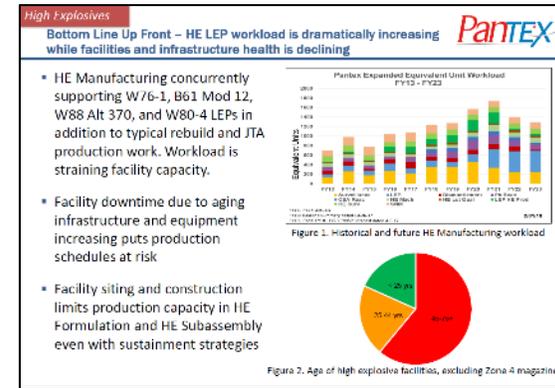
Disciplined processes and transparency have increased execution and credibility resulting in **new authorities, fewer budget control points, and increased resources.**

- New Authorities
  - Minor construction threshold from \$10M to \$20M
  - Decontamination, decommissioning, and demolition process-contaminated facilities less than \$50M
- Fewer Budget Control Points
  - Operations of Facilities
  - Maintenance
  - Recapitalization
- Increased Resources



NNSA is **on the path to modernizing** its infrastructure to meet the mission. Progress has been made **but more will be needed** over the next two decades.

- The 2018 NPR highlights infrastructure as a vital component of nuclear deterrence.
- **Science-Based Infrastructure Stewardship** is improving NNSA’s ability to:
  - Identify infrastructure risks to meeting the mission;
  - Quantify and rank the risks; and
  - Prioritize projects based on risk reduction per project cost.



# *Implementation Panel Discussion*

## **Participants:**

CDR John Beattie – US Navy OPNAV

Scott Lehmkuhl – US Army MEDCOM (DHA)

Sandy Sadler – USDA ARS

Julie Krebs - NNSA

Bob Hill – USAF AFCEC Tyndall

Jason Zeller – US Army IMCOM



BREAK

**LUNCH**  
**Resume @ 01:00PM**  
**Keck 100**

# *BUILDER 3.5 Retrospective*

- New Feature Review
- Bug Fix Review
- Database Optimization
- Performance Issues Introduced by New Features



# *BUILDER 3.5 New Features*

- Inventory Improvement Package
  - Component-Section Status Tracking
  - Custom Configuration of Building
  - Building Summary Screen Additions and Alterations
  - Local / Selective Inventory Unlock
- Catalog Interaction Improvements (API)
  - Costs Data Editable via BUILDER API
  - Catalog Additions via BUILDER API (documentation not yet available)
- Update Scenarios to Support POM
  - Scenarios Work Generation in Support of POM– This feature allows BUILDER users to set FCI targets for their facilities as a part of their Scenario configuration to allow the funding required to meet those targets to be an output of the Scenario in addition to the recommended work actions. To do this, FCI targets can be established similar to other Work Configuration Policies, BUILDER Scenarios generate the recommended work candidates based on the user's Work Configuration settings (Policy Sequences / Prioritization) and then begins "funding" work items for each facility in priority order until the FCI target is achieved. The output is a list of work items that need to be accomplished in order to meet the target FCI.

# *BUILDER 3.5 New Features*

- Scenarios Trust Previous Fiscal Years

- As BUILDER Customers begin to incorporate Scenarios and Work Plans into their standard practices, there are year to year overlaps in planning and execution that require additional functionality in the application. The process and construction time that can be associated with a BUILDER Work Item often drags a work item execution year out from the generation year. The Scenarios module now provides the option to not regenerate Work Items with statuses indicating that funds have been allocated. This will simplify the work and budget projections as Scenarios will no longer be counting work items that have been addressed via previous funding streams.

- Additional BUILDER Auditing Groups

- Work Item changes
- Work Configuration changes
- Cost/Service Life Book changes

- Cost Modifiers

- BUILDER Users now have the ability to create custom cost modifiers (adders and multipliers) that can be specified for a given BUILDER hierarchy level (site/building/component-section/etc.) and users can apply those modifiers to the specific instances that they apply to. This gives increased granularity to apply cost modifiers where they are required without over-applying them.

# *BUILDER 3.5 New Features*

- API Expansion
  - Electronic Acceptance of Cost Data – The BUILDER web-service API has been expanded to allow privileged users to modify BUILDER cost book information and records via web-based API calls. This allows for more seamless integration with third-party cost sources as updates can be configured to be an automated back-end process.
  - Scenario API Additions – The BUILDER web-service API has been expanded to allow privileged users to create, configure, edit, and delete Scenarios through web-based API calls.
- BUILDER Scenario Screen Refresh
  - BUILDER's Scenario module was refreshed a number of years ago using Microsoft's Silverlight library. This technology has since been deprecated and is no longer supported by multiple browsers. In order to ensure continued support and access to BUILDER Scenarios, Silverlight has been replaced using Angular technology allowing for cross-browser functionality. Since additions were made to Scenarios were made in parallel, the original Scenarios screens will remain in parallel with the updated version until the updates can be added to the updated screens.

# BUILDER 3.5 Bug Fixes

## Inventory

- (2871) An “Error on Error” message was being encountered when the ‘Number’ column of a Facility contained a lone letter ‘E’ in the middle of the name. This has been corrected and users should no longer experience this error.
- (3156) When adding an organization, the hierarchy tree now immediately displays the addition without the need for the user to log out, and log back in.
- (3434) The user can now uncheck the “Paint N/A” box in a Distress Survey, and it will remain unchecked after clicking “Save”. In previous versions, this box would default back to being checked.
- (3170) Users will now see a Dialog Box after creating a Site or Complex that already exists in the target Organization.
- (2949) Previously, if there was a NULL value in the database for Construction Type field, it would default to “Leased”. This has been changed so no value is defaulted when DB is NULL, providing a more accurate representation of information to the user.
- (3332) In previous versions of BUILDER, users could not delete a facility if Efficiency Assessments existed. This issue has now been resolved.
- (1673) BUILDER Permissions have been updated to no longer allow Site-Level Master Planners to create organizations.
- (3074) Display of a Component-Section's applied standard has been restored on the Component-Section general information tab.
- (3340) Users are again able to delete facilities in the BUILDER web application without special support from SMS Support.
- (3438) When a facilities were removed from a site or complex, BUILDER was skipping these entities in the rollup process since there was no child data to rollup. As a result, stale PRV values and metrics would be retained. This has been corrected to clear out PRV data for empty sites/complexes.
- (3350) The calculations used for the Coating Condition Index and Remaining Paint Life were disrupted by a previous code update. These calculations have been properly restored for correct calculations.

# *BUILDER 3.5 Bug Fixes*

## **Condition Assessment**

- (1731) Users can no longer enter an invalid blank Distress survey.
- (819) Rather than only selecting a Distress Survey “Density” from the drop-down menu, this field is now computed based on the sub-component quantity and the distress quantity.
- (878) Links to the BUILDER Help content for Distress Survey information has been restored to proper functionality.
- (3445) Distress Survey responses no longer reset the severity to low when entering the "edit" mode on a given entry.

## **Functionality Assessment**

- (746) The capability of generating Functionality related work items was previously lost when the Functional Assessment design was altered to allow for more robust Functionality Assessment customization. These options of generating Functionality Work Items based on Functionality Standards has been restored to proper functionality.

## **Work Generation / Scenarios**

- (3446) The Component Section, Section Name tied to a BUILDER Work Item has now been added to the Work Item Details page.
- (3024) In the past, completing an “Inspection” work item would delete the older, original inspection, but others would remain, as well as creating a blank inspection with no rating. This has been corrected to now simply change the work item status, and take no further action to add inspections or alter CI.
- (3444) The Fiscal Year drop-down would exhibit erratic behavior after Prioritization of work plans was executed. This has been restored to proper functionality.

# BUILDER 3.5 Bug Fixes

## Work Generation / Scenarios

- (3448) When a Work Item is generated for an item that has a warranty in effect (per the Section Detail records), a notification will be provided to the user in the Work Item Details screen to indicate that this work could be accomplished through exercising a warranty.
- (3183) The Work Generation process was revised to properly evaluate the Building Performance Index to determine if a facility replacement is warranted
- (2152) The "Copy Work Items to BUILDER" option in Scenarios will now appear immediately after a Scenario completes running. Navigating away and returning is no longer required to access this functionality.
- (3357) Paint Work Items were previously generated under improper conditions. This has been corrected so that these work candidates are evaluated based on the Policies and Standards.
- (3443) In previous version of BUILDER when a user encounters an error while running Scenarios, the error message did not provide useful information for diagnosing the issue. The error messages have been revised to provide users and support staff better transparency in the issues that need to be resolved for faster issue resolution.
- (3441) In an earlier version of BUILDER, Scenarios scope definitions were expanded to include Organizations. This update provides the ability to review an entire Organization's Work Items as opposed to only at the Site level and below.
- (3440) Errors in exporting Scenarios to Excel have been eliminated and proper functionality restored.
- (2789) Scenarios Analysis Graph has been improved for new margins to provide improved graph display.
- (3346) Policies now properly save user entered data while moving through multiple pages of entries.
- (3423) Work Plan Generation has been adjusted to function properly with facilities that also have projects associated with them.

# BUILDER 3.5 Bug Fixes

## Application Programming Interface

- (3023) KBI API calls have been configured for expected use.
- (2771) Spelling of “SeismicZone” within the DTOrganization class has been corrected.
- (3426) Rollups were occasionally generating errors, even if the user had proper permissions. This is no longer occurring, and errors are only generated if the user attempts to roll up without proper permissions.
- (2789) The BUILDER web-service API was corrected to get/set the organization/site point of contact information.

- (3067) Updates to Work Items through BUILDER's web-service was causing these Work Items to be flagged in a way that they were no longer able to be located through API calls. This has been corrected so that repeated contact with Work Items is functional. If users encounter issues, these can be resolved through contacting SMS Support to clear any lingering issues.

## Application Programming Interface

- (3023) KBI API calls have been configured for expected use.
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# *BUILDER 3.5 Bug Fixes*

- **Tools / General Fixes**
- (3435) During Component-Section Cost Book edits, top header items (i.e. Name, Min Cost, etc.) were not being saved. This has been fixed and these fields now save properly.
- (3442) Errors were being produced under some conditions when uploading, removing, or viewing a PDF or image in BUILDER. This has been corrected and attachments should no longer generate errors.
- (2527) Nightly rollups now properly update the FCI metric, which also occurs after the generation of work items or each time a PRV is changed.
- (821) When a user selects a BRED file for Import, the Import no longer starts automatically but requires the user to select "Proceed" as the user interface was designed to function.
- (1759) Navigation tree search functionality has been updated to reflect the user permissions model.
- (3449) When viewing a Cost Book within BUILDER, the costs displayed on the screen are inflated to current year values. Previously, these values were based on the current calendar year. This has been updated to calculate inflation based on the current fiscal year for consistency across the application.
- (3296) Export of BRED packages of images has been restored to the correct functionality.

# *Database Optimization*

- Only a portion of the database optimizations were rolled into the BUILDER 3.5 release
- The remaining work is targeted for rollout for BUILDER 3.6

# *BUILDER 3.5 Performance Issues*

## **Performance Bug Description**

- Primary Source - Organization level Work Item display feature
- Increased loading of Work Item data loading Work Plan screen
- Went unnoticed on smaller databases
- Large customer databases saw server slow-downs

## **Solutions Employed**

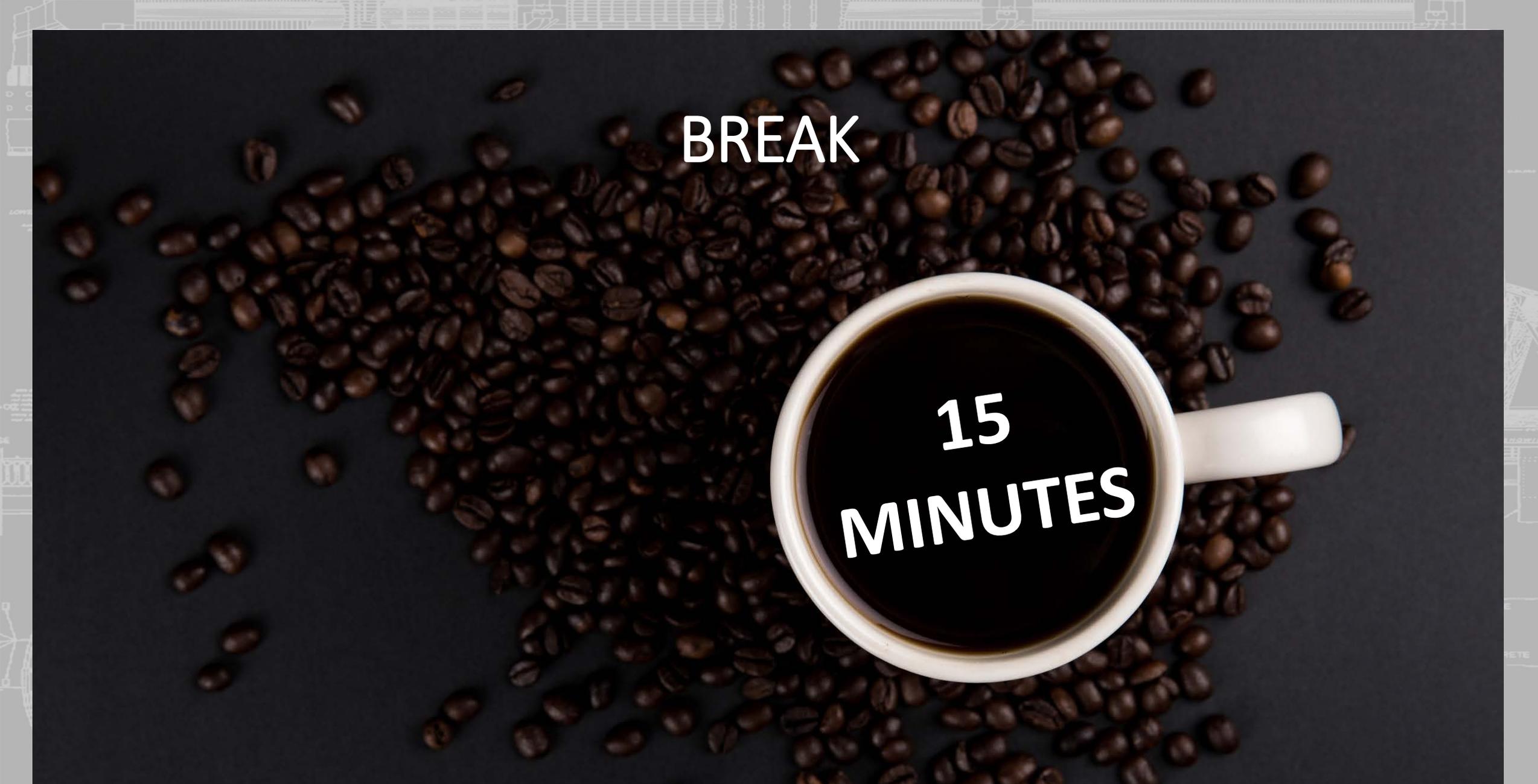
- Hot Fix – 3.5.1 & 3.5.2 – optimized Work Plan screen loading
- Improving server infrastructure configuration to reduce future performance issues

# *Future Release Notes*

<https://support.sms.erdc.dren.mil>

# Breakout Session Format

- We learned! – Pre-appointed leads for each session!
- Incorporating topics from February Summit Survey.
- Workshop style, dig in, ask questions, take notes, and make suggestions for future sessions!
- Attempting to record each session to make it available for later viewing.



**BREAK**

**15  
MINUTES**

# Breakout Session #1

## Locations:

“A” – Keck 100

“B” – Keck E St.  
Conf Rm.

“C” – Keck 206

Online – Refer to  
Agenda

Session 1A: 2:15 PM—4:00 PM Functionality /  
Work Validation and Packaging

Session 1B: 2:15 PM—4:00 PM BUILDER/SMS 101

Session 1C: 2:15 PM—4:00 PM Utilities Working  
Committee Meeting

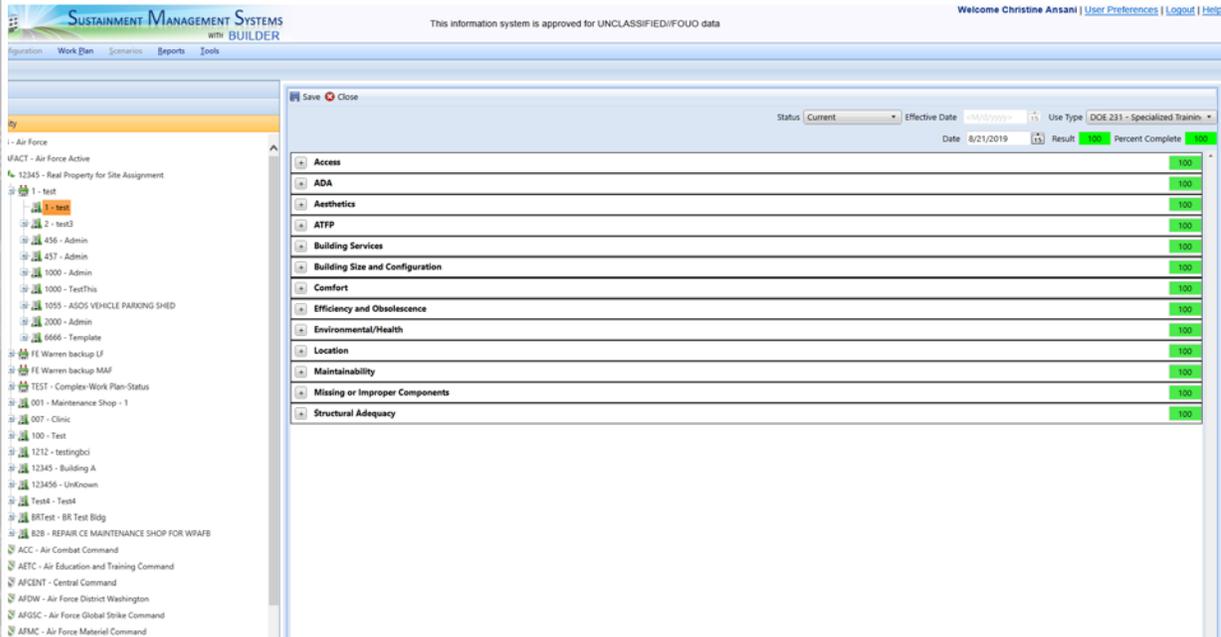
# *Functionality*

Wednesday @ 1400

**Live Demo**

# BUILDER Out of the Box

## Old OBX



## New OBX

- Assessments created using the Whole Building Design Guide's Design Objectives
  - One assessment for each objective – except Cost Effective
- Shorter, more flexible assessments allow for a more complete snapshot of facility functionality
- Include references to any related UFC's and Standards

# New OBX Screenshots

The screenshot displays the Sustainment Management Systems (SMS) interface. The top navigation bar includes 'Work Configuration', 'Work Plan', 'Scenarios', 'Reports', and 'Tools'. The main content area is divided into two panes. The left pane shows a tree view of the system's structure, with 'Functionality' selected under the 'Condition' category. A green arrow points to this selection. The right pane shows the 'Assessment History' table, which is circled in green. The table lists various assessment types, including 'OBX Sustainability', 'OBX Productive', 'OBX Historic Preservation', 'OBX Functional/Operational', 'OBX Aesthetics', and 'OBX Accessibility'. Each row includes the inspector's name, the date of the assessment, the result (0 or 100), and a 'Delete' button. A 'Create New' button is also visible in the top right corner of the table area.

Assessment Type	Inspector	Date	Result	Delete
OBX Sustainability	Christine.V.Ansa	06/14/19	0	Delete
OBX Productive	Christine.V.Ansa	06/14/19	100	Delete
OBX Historic Preservation	Christine.V.Ansa	06/14/19	100	Delete
OBX Functional/Operational	Christine.V.Ansa	06/14/19	100	Delete
OBX Aesthetics	Christine.V.Ansa	06/14/19	0	Delete
OBX Accessibility	Christine.V.Ansa	06/14/19	0	Delete
Cultural resources	Paul.P.Mahern@	05/16/16	100	Delete

# New OBX Screenshots

The screenshot displays the Sustainment Management Systems (SMS) interface. At the top, the logo reads "SUSTAINMENT MANAGEMENT SYSTEMS WITH BUILDER". The user is identified as "Welcome Christine Ansani" with links for "User Preferences", "Logout", and "Help". The system is noted as "UNCLASSIFIED//FOUO data".

The main interface is divided into several sections:

- Inventory:** A tree view on the left shows a hierarchy of assets. The selected path is: 0004 - Air Force > AFACT - Air Force Active > 12345 - Real Property for Site Assignment > 1 - test > 1 - test.
- Condition:** A summary bar at the top right of the main window shows: Status: Current, Effective Date: <M/d/yyyy> 15, Use Type: DOE 231 - Specialized Trainin..., Date: 6/14/2019, Result: 0 (red), Percent Complete: 100 (green).
- OBX - Aesthetics:** The main content area displays a list of assessment categories. The "OBX - Aesthetics" header is circled in green. The categories are:
  - A. External Environment
    - I. Landscape
    - II. Modernization
    - III. Exterior Facilities
    - IV. Trash/Debris
  - B. Facility/Interior
    - I. Building Structures (Exterior)
    - II. Interior Facilities
    - III. Windows and Daylighting
    - IV. Acoustics
    - V. Building Structures (Interior)
    - VI. Wayfinding
    - VII. Carpet
    - VIII. Furniture
    - IX. Modernization
    - X. Trash/Debris

\*This is an example of one of the new OBX Assessments – Aesthetics. The other assessments closely resemble what you see here.

# Other Assessments in BUILDER

## QWE

- **Description:** A high-quality work environment is critical to attracting and retaining an elite workforce, improving efficiency, increasing morale and ensuring a safe work environment. In accordance with Command Policy Letter (CPL) 19-01-AMCOL-I, U.S. Army Materiel Command Major Subordinate Commands (MSC) will implement the QWE initiative at all workplaces by developing an approach for implementing QWE, conducting baseline assessments, identifying shortfalls, prioritizing mitigation efforts and developing comprehensive campaign plans.
- **Example Questions:** Are backflow preventers installed to protect potable water from non-potable water? Is the work area free of mold and the conditions conducive for mold growth? Is this facility properly grounded for the current operation or mission?

## HPSB

The screenshot shows the 'HPSB Score Sheet - Facility' form within the BUILDER software. The interface includes a top navigation bar with 'Save' and 'Close' buttons, a 'Status' dropdown set to 'Current', an 'Effective Date' field with a calendar icon, a 'Use Type' dropdown set to 'DOE 231 - Specialized Training', and a 'Date' field set to '8/21/2019'. A 'Result' field shows 'Percent Complete' with a red progress indicator at '0'. The form content is organized into sections with expandable/collapsible icons:

- LEED Certification:** 'Is this building LEED certified?' with a sub-question 'What type of certification does this building have?' and radio button options for LEED Regular, LEED Silver, LEED Gold, and LEED Platinum.
- 4-2 Employment Principles:** '4-2.2 Re-Commissioning and Retro-Commissioning' with question 6: 'Has the building been commissioned, recommissioned or retro commissioned within the last five years?' and radio button options for Yes, IP, N/A, and No.
- 4-4 Optimize Energy Performance:**
  - 4-4.1 Energy Efficiency:** Question 9: 'Have one of the three options below been used to measure/improve efficient energy performance?' with radio button options for N/A, Yes, IP, N/A, and No.
    - 9a. Option 1: Demonstrated achievement of an ENERGY STAR performance score of 75 or higher.
    - 9b. Option 2: Demonstrated energy use reduction of 20% compared to 2003.
    - 9c. Option 3: Calculated energy use reduction of 20% compared to ASHRAE 90.1 baseline.
  - Question 10: 'Do you require products that are ENERGY STAR -qualified or meet FEMP-designated efficiency when available?' with radio button options for Yes, IP, N/A, and No.
  - Question 11: 'Are products with the lowest standby power consumption required?' with radio button options for Yes, IP, N/A, and No.
- 4-4.3 Measurement and Verification:** Question 13: 'Does the building have building level electrical, natural gas, and/or steam meters as applicable, connected to an installation wide energy and utility monitoring and control system?' with radio button options for Yes, IP, N/A, and No.
- 4-4.4 Benchmarking:** Question 14: 'Are current building performance data being compared with previous years' performance data in a measurement and tracking tool and used in informing capital investment decisions?' with radio button options for Yes, IP, N/A, and No.
- 4-5 Protect and Conserve Water:**
  - 4-5.1 Indoor Water:** Question 15: 'Have one of the two options below been used to reduce indoor potable water use?' with radio button options for N/A, Yes, IP, N/A, and No.
    - 15a. Option 1: Calculations to determine water use equal to or lower than a 2006 UPC or IPC baseline.

# *Helpful Links*

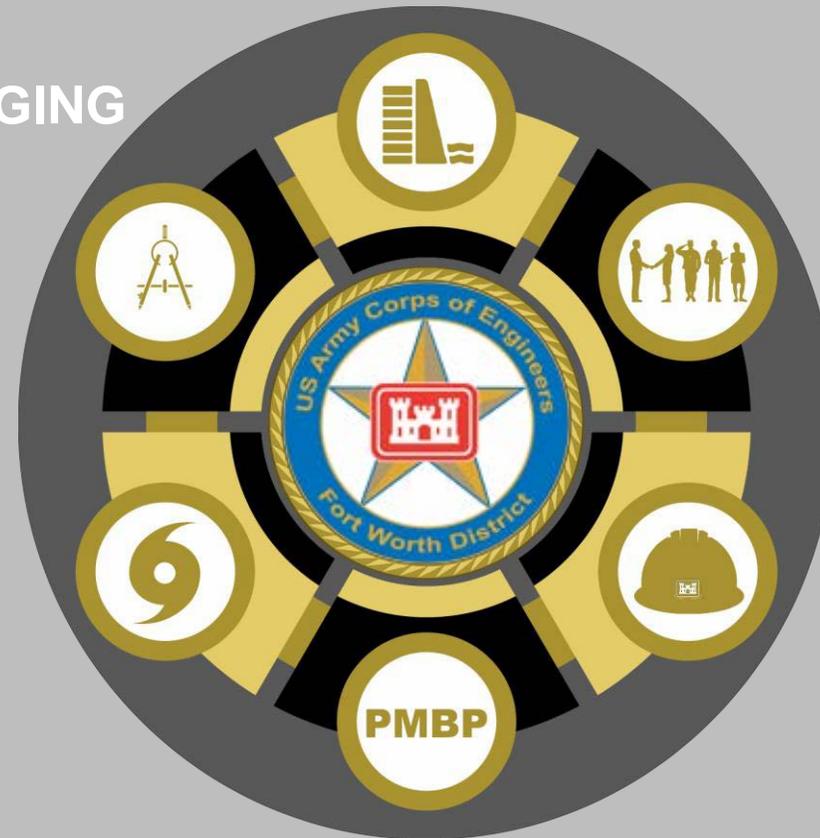
- <https://www.sms.erdcdren.mil/Products/BUILDER/Downloads>
  - “BUILDER Start Guide”
  - “BUILDER Help Documentation”
  - “ERDC CERL TN-06-2 - Building-Level Functionality Assessment”
- <https://www.wbdg.org/design-objectives>
  - Links to design objectives

# *Functionality Working Group*

- If you want to be on the email list regarding new developments for functionality, please email [Ryan.E.Smith@erdc.dren.mil](mailto:Ryan.E.Smith@erdc.dren.mil) or [Christine.V.Ansani@usace.army.mil](mailto:Christine.V.Ansani@usace.army.mil).

# WORK VALIDATION / PACKAGING

Kevin Craig  
14 August 2019  
BUILDER Summit



**MISSION / PEOPLE / TEAMWORK**



US Army Corps  
of Engineers



U.S. ARMY

# SRM BUSINESS PROCESS

## 2. Programming

- Project Prioritization
- Site Visit for Phase 2
- Preliminary Project Description (WorkPackage)
- Initial Cost Estimate (30%)
- Agency Support Review  
*Ensures Bona Fide need at Site*
- Construction & Contract Agent Identified

## 3. Execution - Design

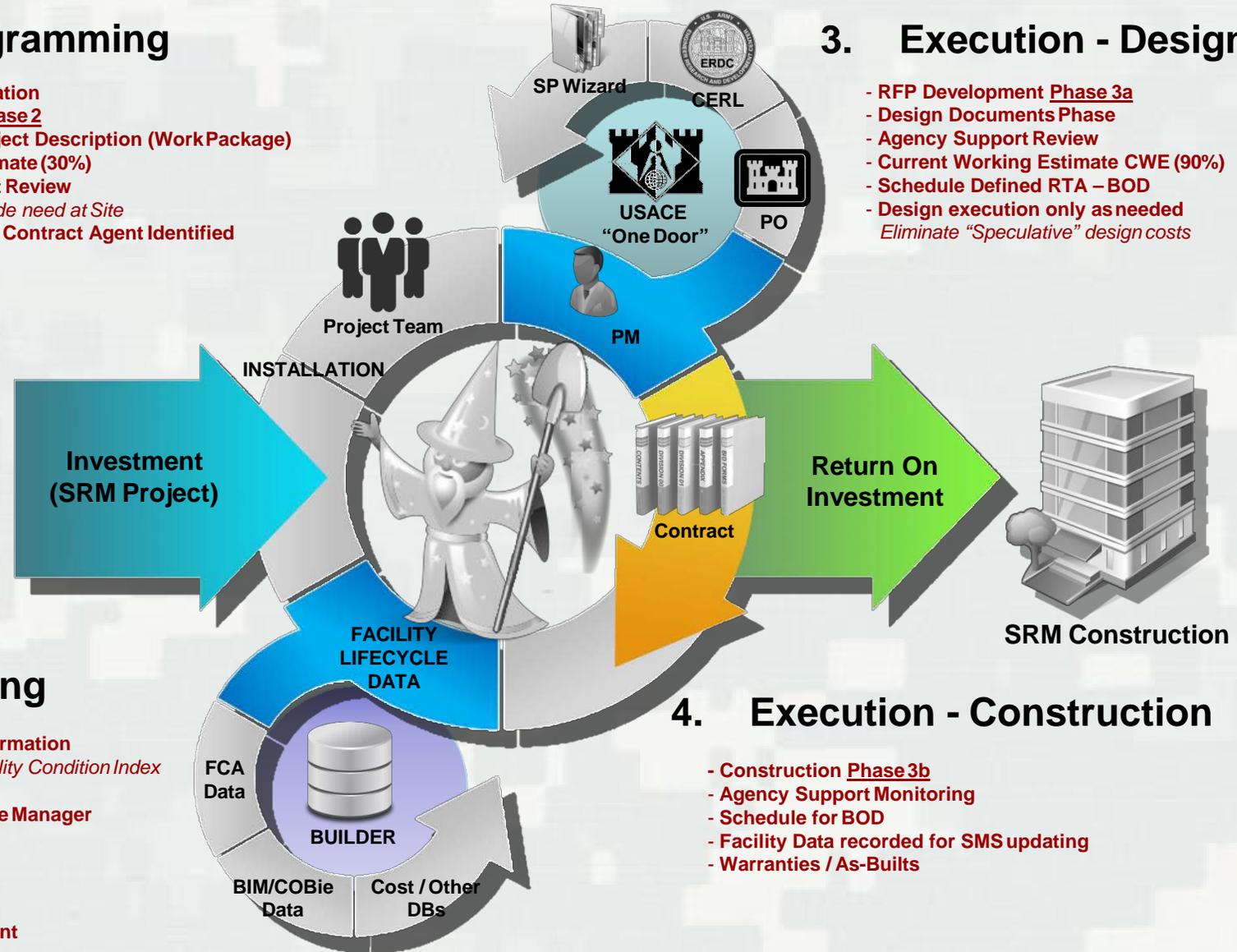
- RFP Development Phase 3a
- Design Documents Phase
- Agency Support Review
- Current Working Estimate CWE (90%)
- Schedule Defined RTA – BOD
- Design execution only as needed  
*Eliminate "Speculative" design costs*

## 1. Planning

- Phase 1 Facility information  
*Builder = Official Facility Condition Index*
- Work Requests
- Knowledge from Site Manager
- Life - Health - Safety
- Quality of life needs
- Code Requirements
- Change of Mission
- Facility Reassignment

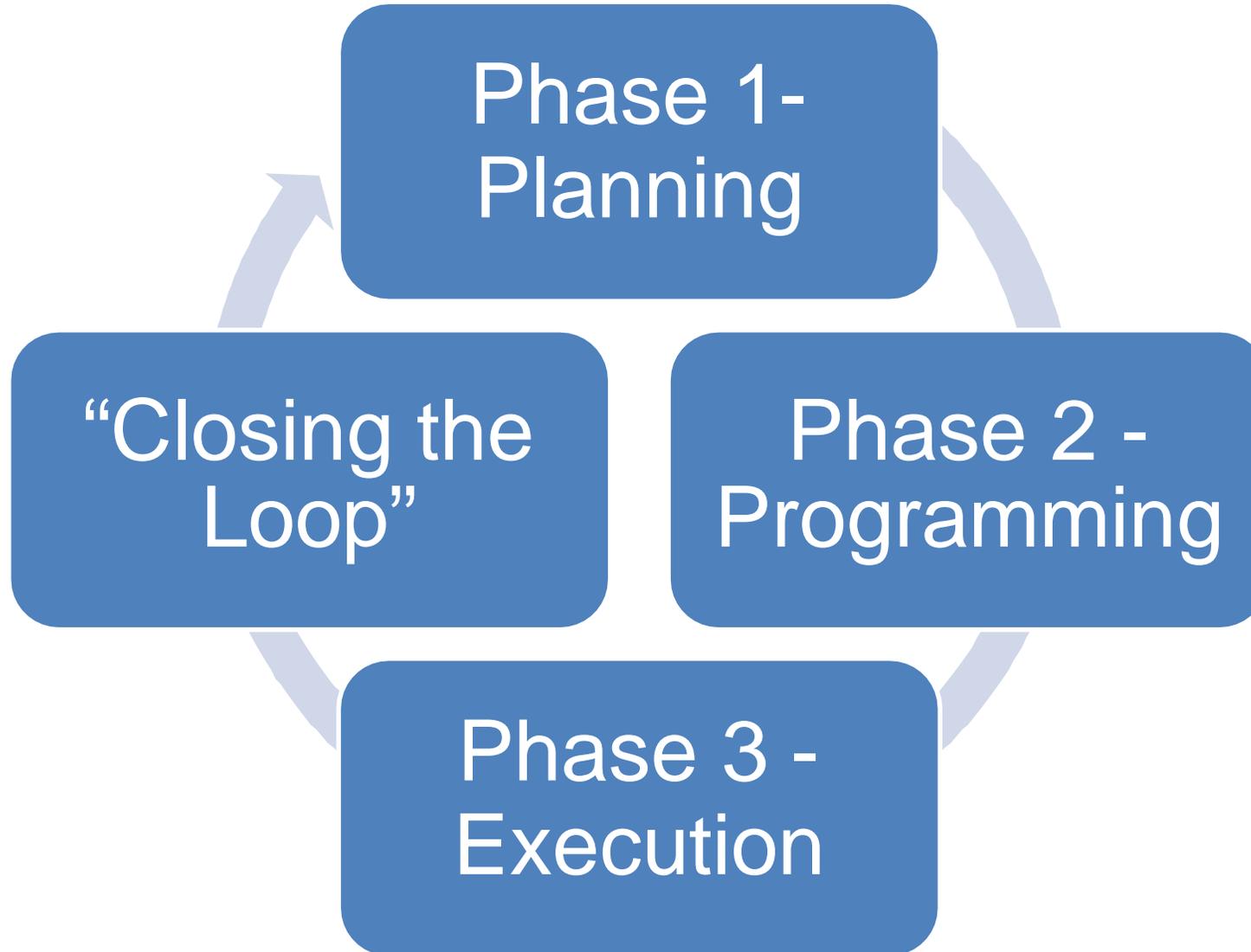
## 4. Execution - Construction

- Construction Phase 3b
- Agency Support Monitoring
- Schedule for BOD
- Facility Data recorded for SMS updating
- Warranties / As-Builts



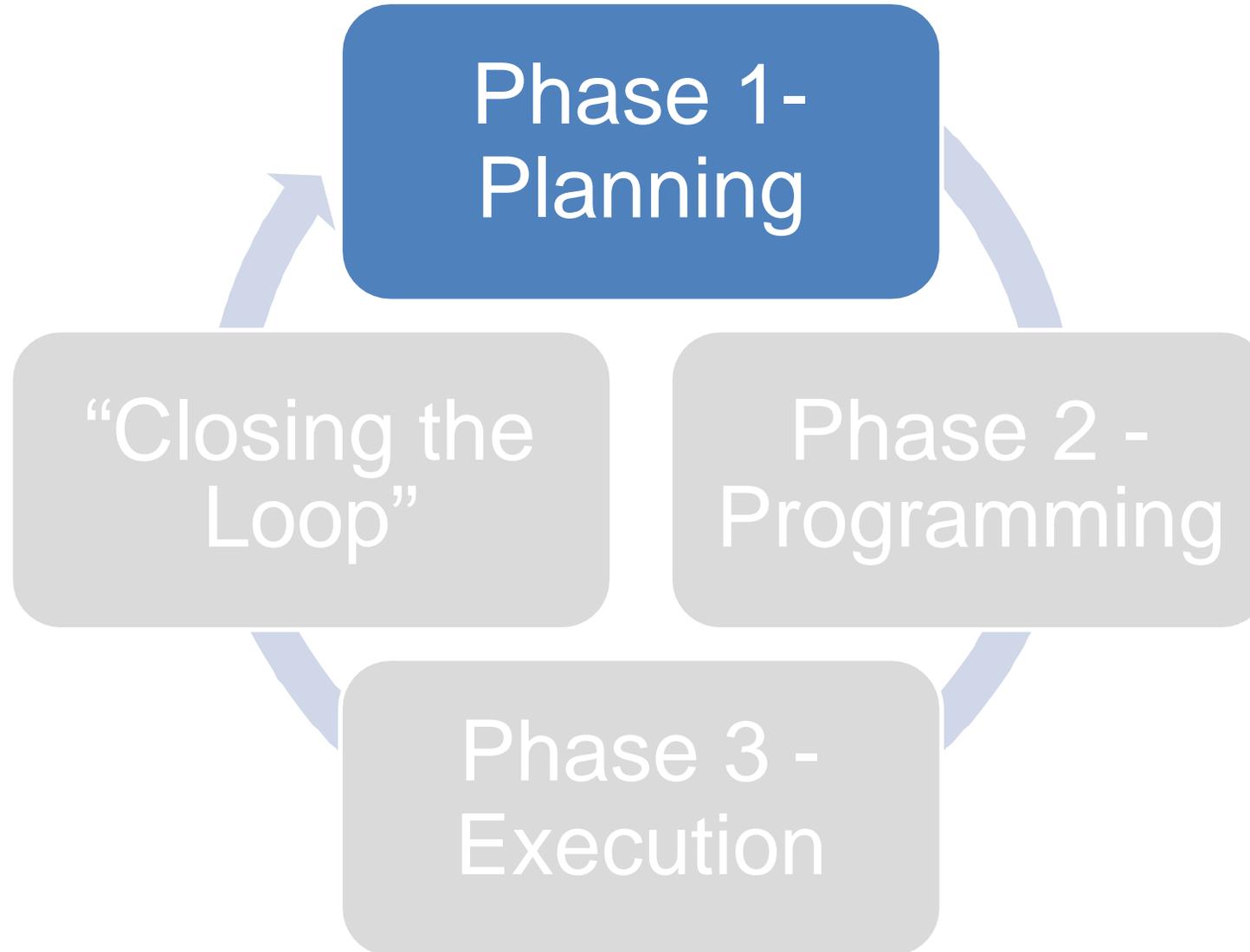


# SRM PROGRAMS - PHASED APPROACH





# SRM PROGRAMS - PHASED APPROACH





# PHASE 1 - PLANNING



## ❑ Facility Condition Assessments – BUILDER™ SMS

- Data available in BUILDER™

## ❑ Packaging:

### ▪ BUILDER Synopsis Report:

- Standards / Policies
- 5-Year Costs by System (Graph)
- 5-Year Costs by FY by System (Graph)
- Building Summary Reports with photos
- Work Action Report
- Detailed Inspection Summary Report
- Comprehensive Inventory Report

## ❑ 5-Year Scenario Summary

## ❑ 5-Year Planning Requirements (Initial Project Proposals)





# BUILDER™ SYNOPSIS REPORT

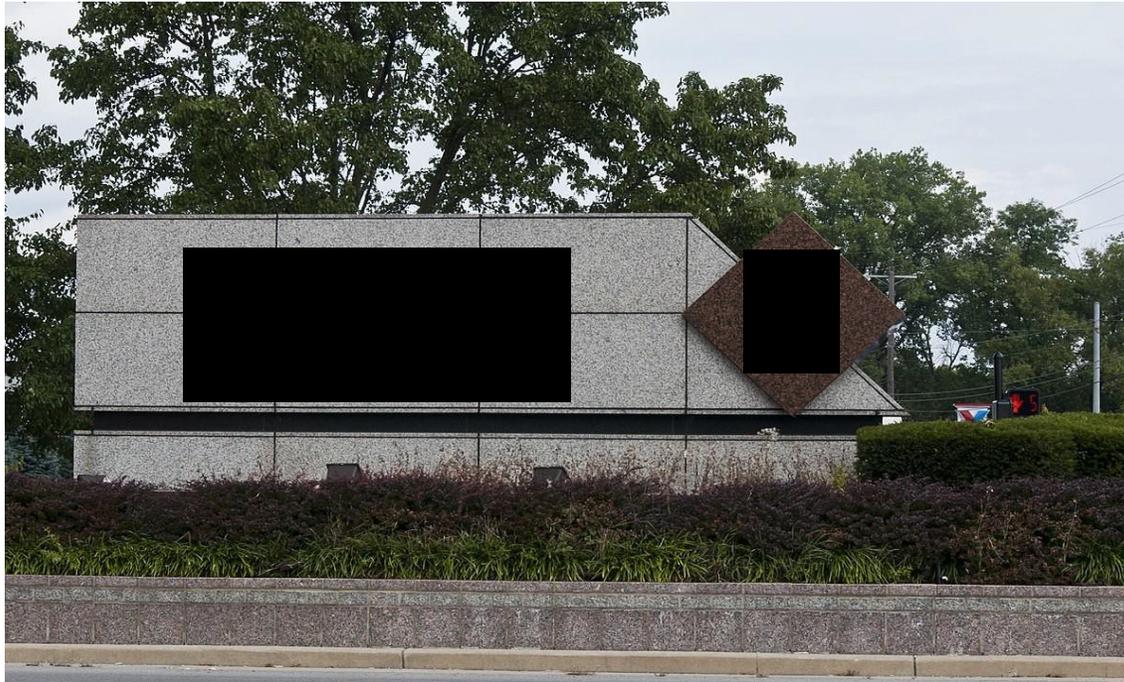


## FACILITY CONDITION ASSESSMENT REPORT



Assessment Date:

Report Date:



<b>Number of Facilities:</b>	208
<b>Current PRV:</b>	\$892,544,549

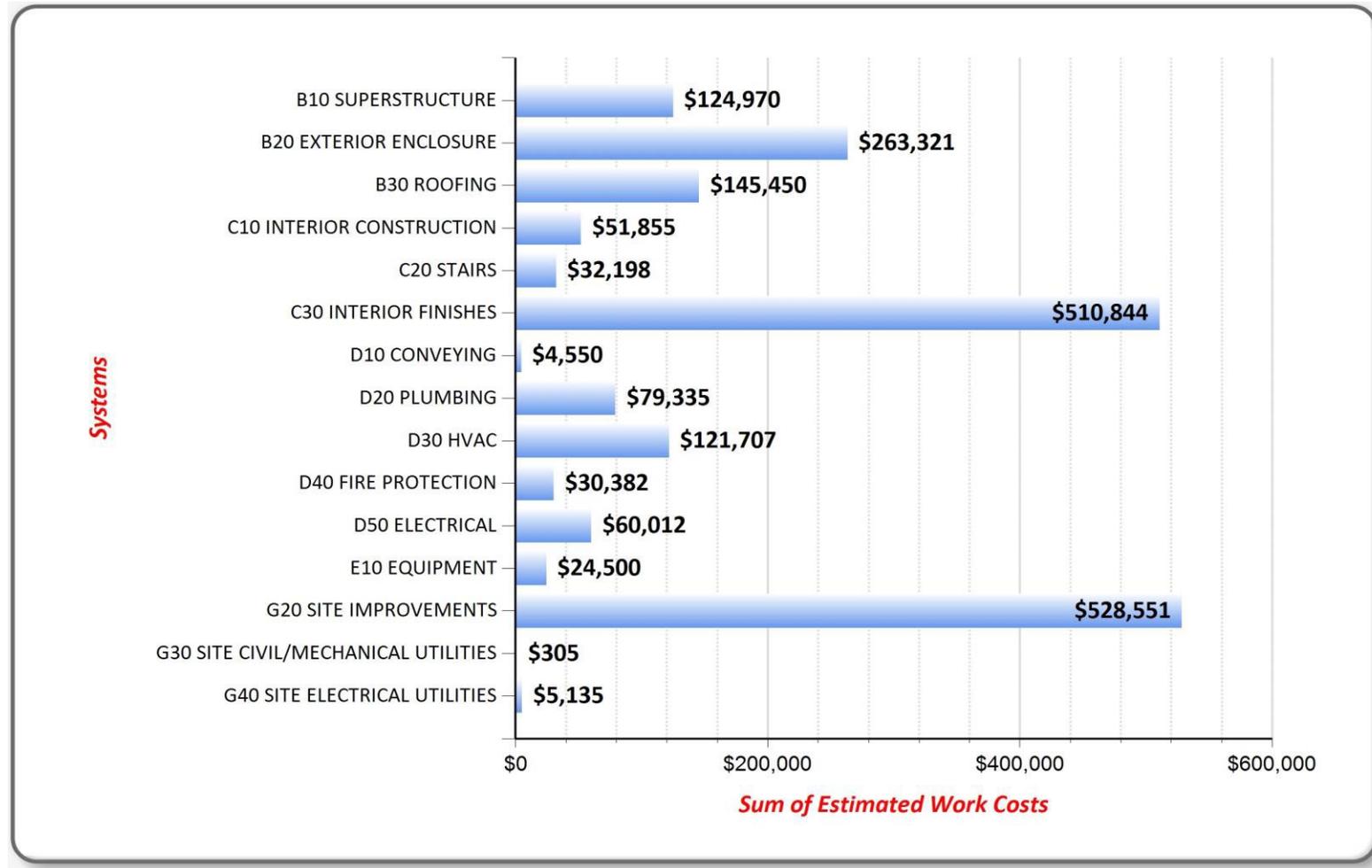
Fiscal Year	Work Summary
2019	\$27,987,760
2020	\$12,547,030
2021	\$6,085,740
2022	\$21,471,620
2023	\$2,459,070

BUILDER METRIC		SCORE
Condition Index	CI:	85
Functionality Index	FI:	100
Performance Index	PI:	89
Facility Condition Index	FCI:	97

# FIVE-YEAR WORK PLAN BY SYSTEM

Plant Replacement Value (PRV) = \$35,606,174

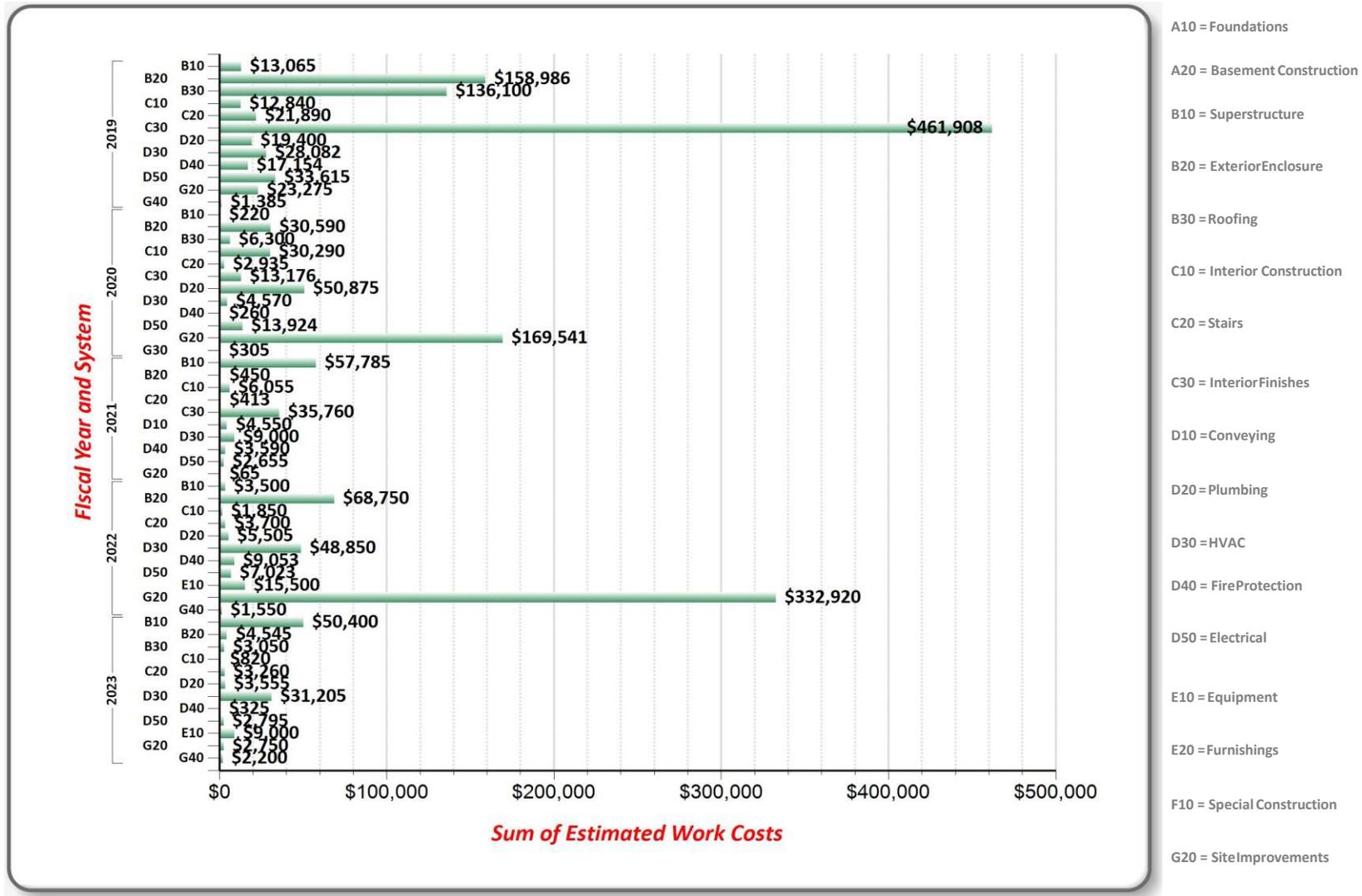
Total Five-Year Work Plan Costs = \$1,983,115



# FIVE-YEAR WORK PLAN BY FISCAL YR AND SYSTEM

Plant Replacement Value (PRV) = \$35,606,174

Total Five-Year Work Plan Costs = \$1,983,115



# BUILDING CONDITION SUMMARY REPORT

2228 - ColdStorage



<b>BUILDING ASSET ID:</b>	2228
<b>BUILDING USE:</b>	COLD STORAGE, BASE
<b>YEAR BUILT:</b>	1980
<b>AREA(UoM):</b>	4,332 (SF)
<b>PLANT REPLACEMENT COST:</b>	\$576,543
<b>DATE OF LAST INSPECTION:</b>	8/22/2018
<b>SUM OF WORK ITEMS FOR CURRENT FY:</b>	\$118,395
<b>SUM OF WORK ITEMS OVER NEXT 5 YEARS:</b>	\$136,375

BUILDER(TM) METRIC	SCORE
Condition Index	CI: 84
Functionality Index	FI: 100
Performance Index	PI: 89
Facility Condition Index	FCI: 100

Building Asset ID	Building Name	A10 - Foundations	A20 - Basement Construction	B10 - Superstructure	B20 - Exterior Enclosure	B30 - Roofing	C10 - Interior Construction	C20 - Stairs	C30 - Interior Finishes	D10 - Conveying	D20 - Plumbing	D30 - HVAC	D40 - Fire Protection	D50 - Electrical	E10 EQUIPMENT	F10 SPECIAL CONSTRUCTION	G20 - Site Improvements	G40 - Site Elec. Utilities
2228	Cold Storage	87		86	82	81	35						94	86			88	

# DETAILED WORK ACTION LISTING REPORT

Raw costs of recommendations:

\$1,983,115

Sorted worst conditions to best conditions

Bldg Num	System	Component	Comp Type	Qty	UoM	Work Item Description	Estimated Cost	Fiscal Year	Projected CI
5223	D30 HVAC	D3040 DISTRIBUTION SYSTEMS	Fan System, Wall Exhaust	1	EA	Replace D3040 DISTRIBUTION SYSTEMS FL1 D304007 EXHAUST SYSTEMS Fan System, Wall Exhaust	\$2,900	2019	10
5223	D20 PLUMBING	D2010 PLUMBING FIXTURES	Emergency Safety Shower and Eyewash Station	1	EA	Replace D2010 PLUMBING FIXTURES FL1 D201090 OTHER PLUMBING FIXTURES Emergency Safety Shower and Eyewash Station	\$1,100	2019	10
5223	B30 ROOFING	B3010 ROOF COVERINGS	Modified Bitumen	96	SF	Replace B3010 ROOF COVERINGS ROOF EQUIPMENT HOUSE B301002 LOW SLOPE ROOF SYSTEMS Modified Bitumen	\$850	2019	30
PL	G20 SITE IMPROVEMENTS	G2020 PARKING LOTS	Asphalt	3,166	SF	Replace G2020 PARKING LOTS ATRIUM PL - NON REP SAMPLE G202003 PAVED SURFACES Asphalt	\$22,500	2019	30
2218	B20 EXTERIOR ENCLOSURE	B2030 EXTERIOR DOORS	Door, double, steel, deluxe, hollow metal, 6ft x 7ft	1	EA	Replace B2030 EXTERIOR DOORS B203001 SOLID DOORS Door, double, steel, deluxe, hollow metal, 6ft x 7ft	\$7,900	2019	32
2212	D20 PLUMBING	D2020 DOMESTIC WATER DISTRIBUTION	Water Heaters, Commercial, Electric - 50 gal, 9 KW, 37 GPH	1	EA	Replace D2020 DOMESTIC WATER DISTRIBUTION D202003 DOMESTIC WATER EQUIPMENT Water Heaters, Commercial, Electric - 50 gal, 9 KW, 37 GPH	\$7,800	2019	34
2228	C10 INTERIOR CONSTRUCTION	C1010 PARTITIONS	Wood Guardrail	154	LF	Replace C1010 PARTITIONS C101004 INTERIOR GUARDRAILS & SCREENS Wood Guardrail	\$5,200	2019	35
2222	B20 EXTERIOR ENCLOSURE	B2010 EXTERIOR WALLS	Metal Panel	1,776	SF	Replace B2010 EXTERIOR WALLS B201001 EXTERIOR CLOSURE Metal Panel	\$27,000	2019	39
2212	C30 INTERIOR FINISHES	C3020 FLOOR FINISHES	Epoxy Paint, primer, topcoat, and enamel, two part, sprayed	1,191	SF	Replace C3020 FLOOR FINISHES C302009 FLOOR TOPPINGS AND TRAFFIC MEMBRANES Epoxy Paint, primer, topcoat, and enamel, two part, sprayed	\$3,150	2019	44
5223	B20 EXTERIOR ENCLOSURE	B2030 EXTERIOR DOORS	Wood	1	EA	Replace B2030 EXTERIOR DOORS ROOF B203001 SOLID DOORS Wood	\$4,100	2019	44
5223	B20 EXTERIOR ENCLOSURE	B2010 EXTERIOR WALLS	Wood Cladding w/Stud Backup	768	SF	Replace B2010 EXTERIOR WALLS ROOF EQUIPMENT HOUSE B201001 EXTERIOR CLOSURE Wood Cladding w/Stud Backup	\$13,000	2019	47
2222	B30 ROOFING	B3010 ROOF COVERINGS	Formed Metal	3,884	SF	Replace B3010 ROOF COVERINGS B301001 STEEP SLOPE ROOF SYSTEMS Formed Metal	\$36,500	2019	48

# DETAILED INSPECTION SUMMARY REPORT

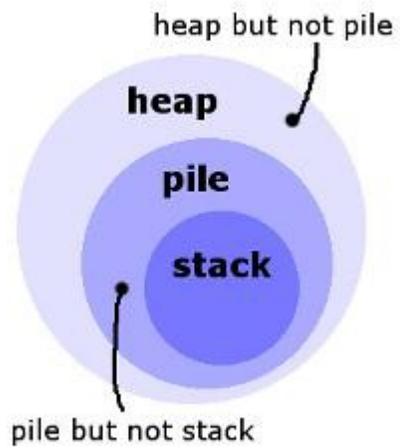
Fac No	Facility Name	Year	Size	Ftrs	Component				Section Category			Section Subtype	Section Name	Sec Qty	UoM
	Section Year Source	SecYr	Painted?	PaintYr	CSCI	CSCCI	Insp Date	Expected Rating	Comp Rating	Paint Rating	No of Insp Images	Section Comments	Insp Comments		
2204	District HQ		1946	90,588	3	A1030 SLAB ON GRADE			A103001 STANDARD SLAB ON GRADE			General	ANNEXFL1	10,272	SF
	Estimated	2000	False		87		8/22/2018	98	88		0				
2204	District HQ		1946	90,588	3	A1030 SLAB ON GRADE			A103001 STANDARD SLAB ON GRADE			General	B1	24,039	SF
	Estimated	1946	False		88		8/21/2018	43	88		0				
2204	District HQ		1946	90,588	3	A2020 BASEMENT WALLS			A202001 BASEMENT WALL CONSTRUCTION			CIP Concrete	B1	79,758	LF
	Estimated	1946	False		88		8/21/2018	87	88		0				
2204	District HQ		1946	90,588	3	B1010 FLOOR CONSTRUCTION			B101003 FLOOR DECKS AND SLABS			Slab - CIP Concrete	FL1	24,039	SF
	Estimated	1946	False		87		8/21/2018	0	88		0				
2204	District HQ		1946	90,588	3	B1010 FLOOR CONSTRUCTION			B101003 FLOOR DECKS AND SLABS			Slab - CIP Concrete	FL2	23,257	SF
	Estimated	1946	False		87		8/21/2018	0	88		0				
2204	District HQ		1946	90,588	3	B1020 ROOF CONSTRUCTION			B102001 STRUCTURALFRAME			Beam/Girder	ANNEXFL1	100	LF
	Estimated	2000	True	2000	87		8/22/2018	98	88	88	0				
2204	District HQ		1946	90,588	3	B1020 ROOF CONSTRUCTION			B102004 CANOPIES			Canopies, Aluminum entrance type	ANNEX FL 1 ENTRY E&W	576	SF
	Estimated	2000	False		86		8/22/2018	18	88		0				
2204	District HQ		1946	90,588	3	B1020 ROOF CONSTRUCTION			B102004 CANOPIES			General	FL1	80	SF
	Estimated	1980	False		86		8/21/2018	0	88		0				
2204	District HQ		1946	90,588	3	B2010 EXTERIOR WALLS			B201001 EXTERIOR CLOSURE			E.I.F.S.	ANNEXFL1	10,354	SF
	Estimated	2000	True	2000	87		8/23/2018	93	88	88	0				

# COMPREHENSIVE INVENTORY REPORT

A1030 SLAB ON GRADE													
Section Category	Section Subtype	Section Name	Sec Qty	Sec UM	Sec Year	Year Src	DL	Age	RDL	RSL	CSCI	SectionComments	
A103001 STANDARD SLAB ON GRADE	General	ANNEX FL1	10,272	SF	2000	Estimated	75	19	56	39	87		
A103001 STANDARD SLAB ON GRADE	General	B1	24,039	SF	1946	Estimated	75	73	2	39	88		
A2020 BASEMENT WALLS													
Section Category	Section Subtype	Section Name	Sec Qty	Sec UM	Sec Year	Year Src	DL	Age	RDL	RSL	CSCI	SectionComments	
A202001 BASEMENT WALL CONSTRUCTION	CIP Concrete	B1	79,758	LF	1946	Estimated	150	73	77	78	88		
B1010 FLOOR CONSTRUCTION													
Section Category	Section Subtype	Section Name	Sec Qty	Sec UM	Sec Year	Year Src	DL	Age	RDL	RSL	CSCI	SectionComments	
B101003 FLOOR DECKS AND SLABS	Slab - CIP Concrete	FL1	24,039	SF	1946	Estimated	35	73	-38	18	87		
B101003 FLOOR DECKS AND SLABS	Slab - CIP Concrete	FL2	23,257	SF	1946	Estimated	35	73	-38	18	87		
B1020 ROOF CONSTRUCTION													
Section Category	Section Subtype	Section Name	Sec Qty	Sec UM	Sec Year	Year Src	DL	Age	RDL	RSL	CSCI	SectionComments	
B102001 STRUCTURAL FRAME	Beam/Girder	ANNEX FL1	100	LF	2000	Estimated	75	19	56	39	87		
B102004 CANOPIES	Canopies, Aluminum entrance type	ANNEX FL 1 ENTRY E&W	576	SF	2000	Estimated	15	19	-4	7	86		
B102004 CANOPIES	General	FL1	80	SF	1980	Estimated	15	39	-24	7	86		
B2010 EXTERIOR WALLS													
Section Category	Section Subtype	Section Name	Sec Qty	Sec UM	Sec Year	Year Src	DL	Age	RDL	RSL	CSCI	SectionComments	
B201001 EXTERIOR CLOSURE	E.I.F.S.	ANNEX FL1	10,354	SF	2000	Estimated	50	19	31	26	87		
B201001 EXTERIOR CLOSURE	Metal Siding	N/A	265,860	SF	1980	Estimated	30	39	-9	15	87		
B201004 PARAPETS	General	ANNEX ROOF	374	LF	2000	Estimated	20	19	1	10	86		
B201004 PARAPETS	General	ROOF	1,097	LF	2009	Estimated	20	10	10	10	86		
B201005 EXTERIOR LOUVERS & SCREENS	Aluminum, 48" x 36"	B1	1	EA	1980	Estimated	60	39	21	31	87		
B201006 BALCONY WALLS & HANDRAILS	Ladder	ROOF	36	LF	1980	Estimated	15	39	-24	7	86		
B2020 EXTERIOR WINDOWS													
Section Category	Section Subtype	Section Name	Sec Qty	Sec UM	Sec Year	Year Src	DL	Age	RDL	RSL	CSCI	SectionComments	
B202001 WINDOWS	Aluminum Windows	B1	106	EA	1980	Estimated	75	39	36	39	87		
B202001 WINDOWS	Aluminum Windows	FL1	233	EA	1980	Estimated	75	39	36	39	87		

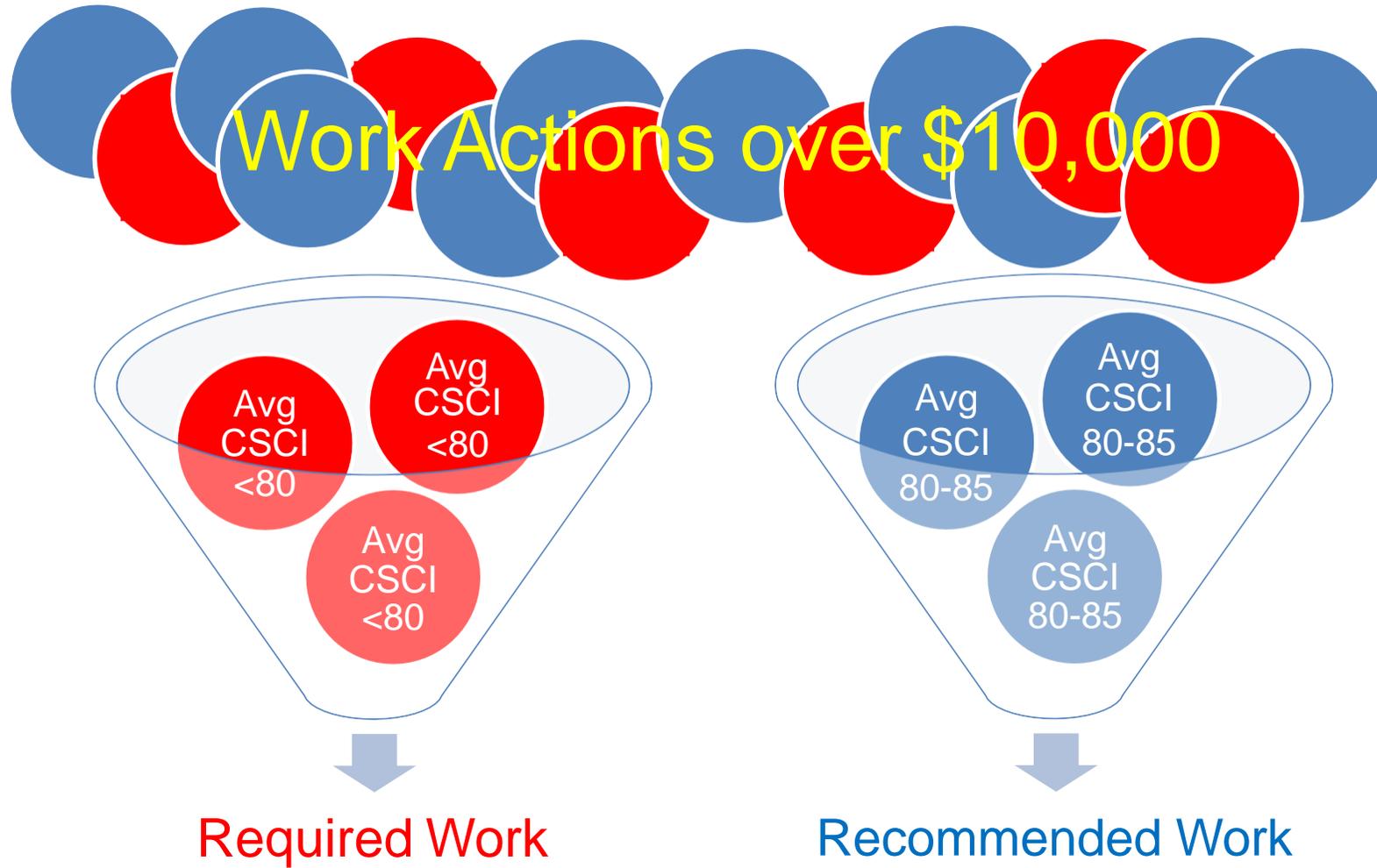
# 5-YEAR SCENARIO SUMMARY

Building	Facility ID	Area (SF)	PRV	TotalWork	2019			2020			2021			2022			2023		
					FY WorkCost	BC	FCI	FYWork	BC	FCI	FYWork	BCI	FCI	FYWork	BC	FCI	FY WorkCost	BC	FCI
128 - MATERIAL ENVELOPE 5	1182519	2,584	\$976,740	\$7,250	-	87	100	-	85	100	\$3,250	84	100	\$2,850	84	100	\$1,150	85	100
1526 - CONFORMING STRGE FACILITY OPERATIONAL HAZARDOUS/FLAMMABLE STORAGE	547761	1,467	\$1,002,882	\$68,680	\$25,000	84	98	\$35,190	85	96	-	88	100	\$2,000	85	100	\$6,490	82	99
158 - GENERAL PURPOSE WAREHOUSE	547628	63,226	\$23,899,149	\$1,722,780	\$743,040	78	97	\$11,550	83	100	\$140,950	81	99	\$525,500	82	98	\$301,740	83	99
159 - GENERAL PURPOSE WAREHOUSE	90879	64,359	\$36,490,938	\$2,713,960	\$2,496,800	69	93	\$16,500	86	100	\$34,000	85	100	\$11,450	84	100	\$155,210	82	100
1629 - HAZ FLAM PACKING SHED GENERAL STORAGE	89339	2,060	\$688,356	\$2,500	-	82	100	\$2,500	81	100	-	81	100	-	79	100	-	77	100
164 - GENERAL WAREHOUSE SUPPLY	90345	53,987	\$21,427,190	\$1,865,510	\$1,245,170	67	94	\$5,800	81	100	\$177,850	80	99	\$428,400	80	98	\$8,290	82	100
1656 - WEIGHTING FACILITY	87266	2,812	\$470,436	\$231,150	\$81,340	69	83	\$56,660	78	88	\$2,500	81	99	\$68,650	79	85	\$22,000	85	95
1665 - HAZARDOUS/FLAMMABLE STORAGE	547661	12,040	\$8,506,508	\$842,830	\$330,170	79	96	\$90,140	84	99	\$138,350	85	98	\$278,050	85	97	\$6,120	89	100
167 - SHIP SERVICE SUPPORT BLDG	946141	55,923	\$230,675,260	\$606,680	\$220,300	88	100	\$9,400	87	100	\$55,860	85	100	\$219,850	83	100	\$101,270	82	100
1733 - ADMIN GENERAL WAREHOUSE	83221	49,031	\$18,480,583	\$889,390	\$560,700	84	97	\$68,180	88	100	\$127,020	87	99	\$21,630	86	100	\$111,860	84	99
1747 - HAZARDOUS&FLAMMABLES STOREHOUSE	83512	33,240	\$24,533,930	\$225,080	\$59,400	88	100	\$122,470	87	100	\$8,270	86	100	\$2,500	84	100	\$32,440	82	100
1762 - GAS CYLINDER YARD HAZARDOUS&FLAMMABLES STOREHOUSE	83526	7,289	\$2,497,683	\$21,520	-	90	100	\$14,780	88	99	-	89	100	-	87	100	\$6,740	85	100
1770 - INTERMEDIATE MAINTENANCE FACILITY	88400	5,539	\$4,643,236	\$64,690	-	85	100	-	83	100	-	81	100	\$19,000	79	100	\$45,690	80	99
1900 - CENTRAL RECEIVE/CONTAIN OPS WATERFRONT TRANSIT SHED	89699	56,188	\$16,756,961	\$1,504,860	\$22,500	84	100	\$313,690	81	98	\$184,250	82	99	\$841,500	80	95	\$142,920	82	99
1916 - SHIP SERVICES SUPPORT BLDG	1179248	6,084	\$3,509,495	\$14,600	-	90	100	-	88	100	-	86	100	\$12,100	85	100	\$2,500	84	100
203088 - OPEN STORAGE B1733	79268	113,615	\$2,140,258	-	-	80	100	-	76	100	-	72	100	-	68	100	-	63	100
203117 - PAVEMENT BLDG1990	79274	23,292	\$322,188	\$500	-	86	100	-	83	100	-	80	100	\$500	76	100	-	72	100
203353 - OPEN STRG PLATE YARD AT BLDG 66	85176	64,521	\$414,693	-	-	80	100	-	77	100	-	73	100	-	69	100	-	65	100
204537 - SECURITY FENCE WITH GATES AT BLDG 490		633	\$1,116	-	-	87	100	-	85	100	-	82	100	-	80	100	-	78	100
204560 - DLA DISP SVCS LAYDOWN AREA	1112176	441,079	\$4,607,685	\$13,000	-	87	100	-	83	100	-	79	100	\$12,000	75	100	\$1,000	70	100
204561 - DLA DISP SVCS FENCING	1112177	16,345	\$110,851	-	-	73	100	-	71	100	-	70	100	-	68	100	-	67	100
2192 - PRODUCTION SUPPORT BLDG EAST	83235	2,426	\$1,399,390	\$11,100	-	89	100	\$500	87	100	-	86	100	\$2,300	84	100	\$8,300	83	99
2193 - PRODUCTION SUPPORT BLDG WEST	83236	902	\$520,310	\$6,150	-	88	100	-	85	100	-	83	100	\$850	81	100	\$5,300	79	99
393 - GENERAL PURPOSE WAREHOUSE	547639	69,312	\$52,399,261	\$751,420	\$107,950	85	100	\$17,400	84	100	\$29,100	83	100	\$558,650	82	99	\$38,320	83	100
406B - GENERAL DEPOT WAREHOUSE	547592	38,040	\$15,433,277	\$1,002,310	-	81	100	\$853,000	79	94	\$50,000	87	100	\$92,200	87	99	\$7,110	89	100
425 - OPERATIONAL STORAGE (MISC)	84089	716	\$224,210	\$23,000	\$4,800	80	98	\$4,100	80	98	\$1,000	79	99	\$2,250	78	99	\$10,850	76	95
451K - PACKING PLANT GENERAL WAREHOUSE	84099	54,830	\$21,952,680	\$2,156,010	\$19,300	80	100	\$1,284,460	78	94	\$36,500	84	100	\$735,610	82	97	\$80,140	86	100
471 - GENERAL PURPOSE WAREHOUSE	1179933	2,193	\$732,799	\$34,880	-	86	100	\$2,850	84	100	-	82	100	\$30,500	80	96	\$1,530	82	100
474 - GENERAL WAREHOUSE DEPOT	90501	82,030	\$31,465,865	\$518,230	\$45,660	88	100	\$101,020	86	100	\$76,550	85	100	\$149,650	83	100	\$145,350	82	100
475 - GENERAL WAREHOUSE DEPOT	90502	154,851	\$66,425,997	\$1,333,740	\$159,250	86	100	\$62,520	85	100	\$39,650	84	100	\$958,560	83	99	\$113,760	84	100
479 - WAREHOUSE GENERAL DEPOT	90503	119,424	\$45,722,347	\$813,330	\$76,200	89	100	\$81,500	88	100	\$15,000	86	100	\$514,750	84	99	\$125,880	83	100
489 - GENERAL WAREHOUSE CVRD	88470	38,885	\$15,433,277	\$798,600	\$617,000	82	96	-	88	100	\$50,000	87	100	\$112,650	87	99	\$18,950	88	100
490 - DDPH LUMBER WAREHOUSE	88472	31,000	\$16,090,535	\$1,945,890	\$74,000	82	100	\$8,300	81	100	\$52,000	79	99	\$1,798,740	78	89	\$12,850	90	100
491 - GENERAL WAREHOUSE CVRD	88678	33,054	\$13,118,979	\$711,300	\$101,200	77	99	\$41,880	76	100	\$23,800	75	100	\$533,640	73	96	\$10,780	76	100
72 - SHEET METAL SHOP (X17)	547625	3,770	\$2,846,765	\$28,260	\$6,300	72	100	\$11,000	69	100	-	66	100	\$9,700	62	100	\$1,260	59	100





# 5-YEAR PLANNING PROPOSALS





# 5-YEAR PLANNING PROPOSALS



US Army Corps  
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of Engineers®**

## **5-Yr Planning Requirements**

**██████████  
Facilities 155, 161, 333, 340, 351, 368, 376, 380,  
385, 393, 395, 606, 641, 645, 660, 4002, &  
Open Storage Area**

## **BUILDER Scenario Simulation**

July 2019

Prepared by: Jari J. Ulmer, PMP

Standardization & Sustainability Branch  
US Army Corps of Engineers, Fort Worth District

Facility Condition Assessment – Phase II Program Office  
US Army Corps of Engineers  
Team Lead: Don Komara, RA  
Phone: (817) 886 1388  
Email: [Donald.K.Komara@usace.army.mil](mailto:Donald.K.Komara@usace.army.mil)



# 5-YEAR PLANNING PROPOSALS



[REDACTED] - 5-Yr Planning Requirements

## Contents

BUILDER™ System Overview.

SRM Business Process Flow (Phase 2 Focus)

[REDACTED]

Selected Work by Facility

FOS1 Open Storage Lot#1 (RND2)

FACILITY (AREA DEF COUNCIL & CARE)

B376 – MATERIAL PROCESSING WAREHOUSE

B380 – 350 MARTIN LUTHER KING BLVD

BLVD

B645 – 740 PAGE RD

PEACEKEEPER BY BLDG 333

2	
3	BUILDER 5-Yr Scenario Summary
4	
5	
6	B155 – LOGISTICS SUPPORT
6	B161 – 185 COCHRAN ST
6	B333 – 375 PEACEKEEPER WAY
7	B340 – 355 PEACEKEEPER WAY
7	B351 – 775 PEACEKEEPER WAY
8	B368 – MATERIAL PROCESS
8	
9	
9	B385 – 450 MARTIN LUTHER KING
10	B393 – COVERED WAREHOUSE
10	B395 – COVERED WAREHOUSE
10	B606 – 465 DANVILLE DR
11	B641 – 620 PAGE RD
11	
12	B660 – 955 ROBINS PARKWAY
12	4002 – STOR LOT N OF
12	



# 5-YEAR PLANNING PROPOSALS



██████ – 5-Yr Planning Requirements

## B385 – 450 MARTIN LUTHER KING BLVD

RPUID: 511055 BLDG SF: 645,100 PRV: \$1,112,000

### Required Work:

The interior fluorescent lights are past their design life and should be replaced with energy efficient LED models. The chiller is rusting and should be maintained to prevent failure. The modified bitumen roof is blistered over 10% of the main building, as well as the connector section. Ponding occurs around 5% of the roof area. The roof should be spot repaired to extend its life.

### Recommended Work:

N/A

### Work Item Details:

SECTION CATEGORY	QTY	UNIT	5-YRCOST	AVG. CI
D502002 LIGHTING EQUIPMENT	136	EA	\$24,410	72
D303001 CHILLED WATER SYSTEMS	1	EA	\$20,000	79
B301002 LOW SLOPE ROOF SYSTEMS	645,445	SF	\$1,775,000	79

## B393 – COVERED WAREHOUSE

RPUID: 511065 BLDG SF: 336,879 PRV: \$306,000

### Required Work:

There is minor corrosion on 5% of the roof around fixtures and attachment points. These areas need to be repaired and sealed to prevent further corrosion or water penetration.

### Recommended Work:

N/A

### Work Item Details:

SECTION CATEGORY	QTY	UNIT	5-YRCOST	AVG. CI
B301001 STEEP SLOPE ROOF SYSTEMS	172000	SF	\$ 78,000	79

## B395 – COVERED WAREHOUSE

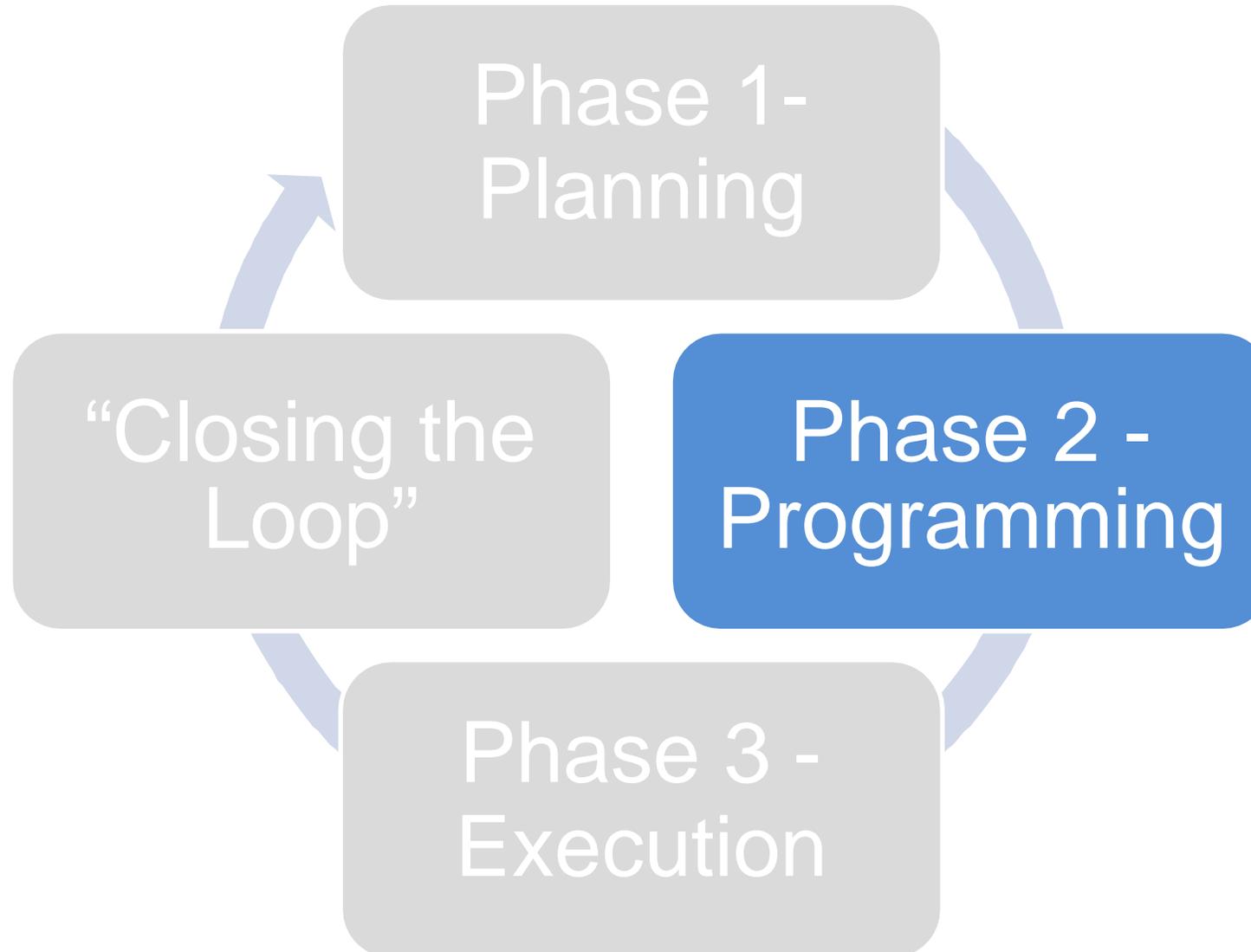
RPUID: 511082 BLDG SF: 79,800 PRV: \$9,587,106

### Required Work:

The dock levelers on the north are corroded and their paint layer has moderately deteriorated, these levelers should be recoated to preserve proper function. The exhaust vent on the SW part of the facility is corroded at its base and should be coated.



# SRM PROGRAMS - PHASED APPROACH





# WORK VALIDATION



**Small Projects Wizard**



# WORK PACKAGE DEVELOPMENT



- Phase 1 forecasts the needs for repair and replacement of facility components.
- Phase 2 supports the transition from Project **Planning** to Project **Programming**.
- Multi-disciplinary architectural-engineering teams return to the installation within 60-120 days of Phase 1 to validate the BUILDER-forecasted deficiencies, add 'emergent' requirements identified by on-site facility managers, and compile information into preliminary project descriptions.
- The Phase 2 Work Package is a **Preliminary Project Description** and includes:
  - ▶ Standardized Concept Statement of Work (~ 30% SOW)
  - ▶ Abbreviated Specifications Section
  - ▶ Architectural drawings, site plans and photos
  - ▶ Facility Inventory Record
  - ▶ Current Working Estimate
- When Project Design/Construction funds are available, the Work Package will be coordinated with the executing agent, providing a seamless transition from Programming to Construction.





# WORK PACKAGE



US Army Corps  
of Engineers®

## Work Package



**Facilities SDA204, SDA205, SDA210, SDA211,  
Open Storage Yards, Roads**

## SRM Projects FY 2018

November 2017

Prepared by: Jari J. Ulmer, PMP

Standardization & Sustainability Branch  
US Army Corps of Engineers, Fort Worth District

Facility Condition Assessment – Phase II Program Office

US Army Corps of Engineers

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# WORK PACKAGE



- Part 1 - GENERAL
  - Project Description, Location, Type (DB, DBB)
  - References, Definitions
  
- Part 2 - PRODUCTS
  - Facility #1
    - Existing Conditions
    - Work Descriptions
    - Work Items (Using UNIFORMAT II Inventory Items)
  - Facility #2
    - Existing Conditions
    - Work Descriptions
    - Work Items (Using UNIFORMAT II Inventory Items)
  
- Part 3 - EXECUTION
  - Technical Requirements / Abbreviated UFGS Specifications
    - Auto-populated based on UNIFORMAT inventory items added in Part 2
  
- Appendix A – Facility Inventory Record
  
- Appendix B – Site Maps / Architectural Drawings / Photos
  
- Appendix C – Cost Estimate (M-II Cost Estimating Software)



# WORK PACKAGE – PART 2



## Facility No. SDA204– WAREHOUSE

### 1. Existing Conditions

Facility SDA204 is a 50,485 SF warehouse, originally constructed in 1942. The facility is used primarily for the receiving and storage of hazardous materials. The facility is constructed of a concrete, slab on grade foundation, which also serves as the facility's floor. The structure is a pre-engineered metal frame and surrounded by a metal panel exterior with a metal roof. Structurally the facility is in good condition. The roof was recently repaired in 2017 by affixing a new metal panel system above the existing using long roofing screws.

The exterior paint of the facility is peeling. The egress doors, fire protection room doors and roll-up doors are rusted and need to be replaced. The concrete slab has cracks and degradation in areas. Additionally, the center isle of the facility is a rail-track channel that was filled with asphalt. The asphalt is uneven and should be repaired or replaced to ensure a flat surface. Restroom and offices are in need of renovations. Cleaning of the clerestory window are needed and damaged panels need replacement. Interior columns and metal panels in the warehouse should be painted.

The HVAC equipment and plumbing is in overall fair condition. The plumbing systems are working properly. The exhaust system for the restrooms and warehouse areas are not functional and need to be replaced. The current HVAC system is working properly however the filters are in need of replacement to prevent damage to the unit. The eye wash stations do not have tempered water and it is recommended to plumb heated supply.

The electrical system is old and has exceeded its useful life. The warehouse is storing flammable liquid material which, according to NFPA 70, is listed as hazardous material. The facility is not currently constructed to the correct hazardous criteria. The team considers this a NFPA 70 violation. To meet the criteria, the facility requires major upgrades including new explosion proof electrical distribution panels, lighting fixtures, receptacles, fire alarm systems, and telecommunications system, as well as all conduit and fittings. Alternatively, DLA should consider the construction of a prefabricated chemical storage facility meeting Classification I, Div I, outside the warehouse and store the flammable material in this storage. The existing interior lighting is provided by linear fluorescent lighting fixtures in the office area and high pressure sodium in the warehouse area. The exterior building perimeter lighting wall mounted LED fixtures. The lighting fixtures appears to be in fair condition.

The North parking lot is constructed of asphalt, with portions that appear to be overlain on concrete, and is in poor condition. There is significant alligator cracking and multiple depressions that hold water. The South parking lot is constructed of asphalt, and is in poor to fair condition. There are cracks, utility cuts, and general deterioration of the asphalt binder.

### 2. Work Description

1. Architectural
  - a. Replace damaged metal wall panels. (2,304 SF)
  - b. Replace rusted roll-up doors, 20'x16'. (2 EA)
  - c. Replace deteriorated seals at bottoms of roll-up doors.
  - d. Replace deteriorated pedestrian doors and door frames. (6 EA)
  - e. Repair damaged drywall in bathrooms and office areas. (125 SF)
  - f. Replace deteriorated doors in restrooms and offices adjacent to the restrooms. (5 EA)
  - g. Replace damaged restroom partitions. (2 EA)
  - h. Replace deteriorated urinal screen. (1 EA)
  - i. Replace deteriorated interior wood paneling. (647 SF)
  - j. Replace damaged wood cabinetry. (272 SF)
  - k. Replace damaged vinyl tile flooring in restrooms, breakroom, and office. (1,100 SF)
  - l. Replace deteriorated acoustical ceiling tiles in offices. (1,161 SF)
  - m. Repair water damaged ceiling drywall. (10 SF)
  - n. Replace drinking fountain at Southeast end. (1 EA)



# WORK PACKAGE – PART 2



2. Mechanical
  - a. Provide piping to/from the following: from Domestic cold water line to instantaneous water heaters; from instantaneous water heater to thermostatic mixing valve; and from thermostatic mixing valve to eyewash station for all 4 eyewash stations. (100 LF)
  - b. Provide thermostatic mixing valves for each eye wash station. (4 EA)
  - c. Provide small electric resistance instantaneous water heater at each eye wash station to provide hot water to for thermostatic mixing valve. (4 EA)
  - d. Provide four high volume/low speed fans in each of the four bays for comfort ventilation. (4 EA)
  - e. Replace warehouse ventilation/exhaust fans. (4 EA)
  - f. Replace fans in men's and woman's restroom with 200 CFM inline units. (2 EA)
  - g. Replace all return air filters for each split system. (2 EA)
3. Electrical
  - a. Provide smoke detector above Fire Alarm panel, per NFPA 72 requirement. (1 EA)
  - b. Replace existing electrical panels with new Class I, Div II explosion proof panel. (4 EA)
  - c. Replace existing exit signs with new, Class I, DIV II explosion proof sign. New exit sign shall be LED type and having minimum 90 minutes battery backup. New exit sign shall be located per NFPA 101 requirement. (10 EA)
  - d. Replace 96 existing pendant mounted light fixtures in the warehouse with new, Class I, DIV II explosion proof lighting. New lights shall be LED type, 3500-5000K. The existing lighting is approximately 100-200W high pressure sodium lighting fixture. (96 EA)
  - e. Replace duplex receptacle in the warehouse with new Class I, DIV II explosion proof duplex receptacle. (50EA)
  - f. Relocate telecommunications systems in the warehouse out of the hazardous location. (Assume 150 LF of conduit & associated terminals.)
4. Civil
  - a. Mill & overlay South parking lot with asphalt. (9,638 SF)
  - b. Mill & overlay North parking lot with asphalt. (6,462 SF)
  - c. Restripe parking lots with retroreflective white and yellow paint. (200 SF)
  - d. Provide surface spall & crack repairs to interior concrete foundation floor. Approximately 0.1% of floor area. (50 SF)
3. **WorkItems**
  1. B2010 Exterior Walls, B201001 Exterior Closure - Metal Panel  
Replace damaged and rusted exterior metal wall panels. Approximately 15% of facility skin. (2,304 SF)
  2. B2030 Exterior Doors, B203004 Overhead and Roll-Up Doors - Steel Rolling, Electric,  
20'x16' Replace rusted roll-up doors. (2 EA)
  3. B2030 Exterior Doors, B203004 Overhead and Roll-Up Doors –  
General Replace deteriorated seals at bottoms of roll-up doors.
  4. B2030 Exterior Doors, B203001 Solid Doors – Steel  
Replace deteriorated pedestrian doors and door frames. (6 EA)
  5. C1010 Partitions, C101001 Fixed Partitions - Wall - Drywall w/Stud  
Framing Repair damaged drywall in bathrooms and office areas. (125 SF)
  6. C1020 Interior Doors, C102001 Standard Interior Doors - Metal Door  
Replace deteriorated doors in restrooms and offices adjacent to the restrooms. (5 EA)



# WORK PACKAGE – PART 3



## PART 3 EXECUTION

### 3.1 TECHNICAL REQUIREMENTS

#### 3.1.2.1 B2010 Exterior Walls

Assemblies would include material contained in exterior closure wall, such as steel framing with metal panel siding. Materials used for interior finishes on exterior walls are not included in this assembly. For example, if the interior side of this masonry wall is sheetrock applied on metal furring strips, the masonry wall is included in this assembly, but the furring strips and sheetrock are categorized as System C3010, Wall Finishes.

Applicable Unified Facility Guide Specifications:  
UFGS 05 50 13 Miscellaneous Metal Fabrications  
UFGS 07 27 10.00 10 Building Air Barrier System  
UFGS 07 92 00 Joint Sealants  
UFGS 08 11 13 Steel Doors and Frames  
UFGS 08 51 13 Aluminum Windows  
UFGS 08 81 00 Glazing  
UFGS 09 90 00 Paints and Coatings  
UFGS 09 96 00 High-Performance Coatings

#### B201002 Exterior Backup Wall Construction

Assemblies include the support structure for the exterior skin or provide load bearing walls for the facility, or both. Materials used for interior finishes on exterior walls are not included in this assembly. For example, if the interior side of the masonry wall is sheetrock applied on metal furring strips, the masonry wall is included in this assembly, but the furring strips and sheetrock are categorized as System C3010, Wall Finishes.

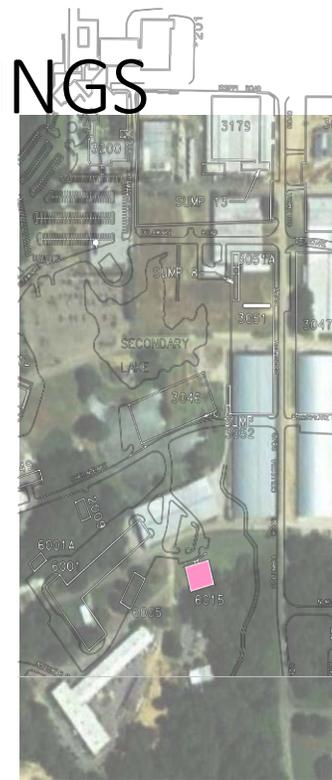
Applicable Unified Facility Guide Specifications:  
UFGS 06 10 00 Rough Carpentry  
UFGS 07 92 00 Joint Sealants

#### B201003 Insulation and Vapor Barrier

Assemblies would include all types of insulation associated with the exterior wall. Rigid, batt, and poured insulation should be separated into different assemblies.

Applicable Unified Facility Guide Specifications:  
UFGS 07 14 00 Fluid-Applied Waterproofing  
UFGS 07 16 19 Metallic Oxide Waterproofing  
UFGS 07 21 13 Board and Block Insulation  
UFGS 07 21 16 Mineral Fiber Blanket Insulation  
UFGS 07 22 00 Roof and Deck Insulation  
UFGS 07 27 10.00 10 Building Air Barrier System  
UFGS 07 92 00 Joint Sealants

# WORK PACKAGE — SITE MAP / DRAWINGS



## DEMOLITION

- METAL PANEL ROOF
- METAL PANEL WALLS
- METAL CANOPIES
- EXT. WINDOWS
- EXT. DOORS
- ACOUSTICAL CEILING
- DRYWALL
- CMU BLOCK WALL
- CARPET
- INT. PERSONNEL DOORS
- SPACES REQUIRED**
- LOBBY (approx. 400 SF)
- CIRCULATION (10% of 6,186 SF)
- OPEN SPACE AREA (approx. 3200 SF)
- OFFICE (approx. 1,200 SF)
- CONFERENCE ROOM (approx. 350 SF)
- VCT (approx. 140 SF)
- BREAK ROOM (approx. 250 SF)
- STORAGE (approx. 150 SF)
- MEN RESTROOM (approx. 150 SF)
- WOMEN RESTROOM (approx. 150 SF)
- ELECTRICAL (approx. 30 SF)
- MECHANICAL (approx. 30 SF)

BUILDING 6015- DPW Headquarters

A-1

Scale: 3/32" = 1'





# WORK PACKAGE – PHOTOS



ARCHITECTURE | Interior



**Ceiling-** Acoustical Tiles show water damage.



**Attic-** Roof leaks are causing moisture to collect in the insulation and damage ceilings.



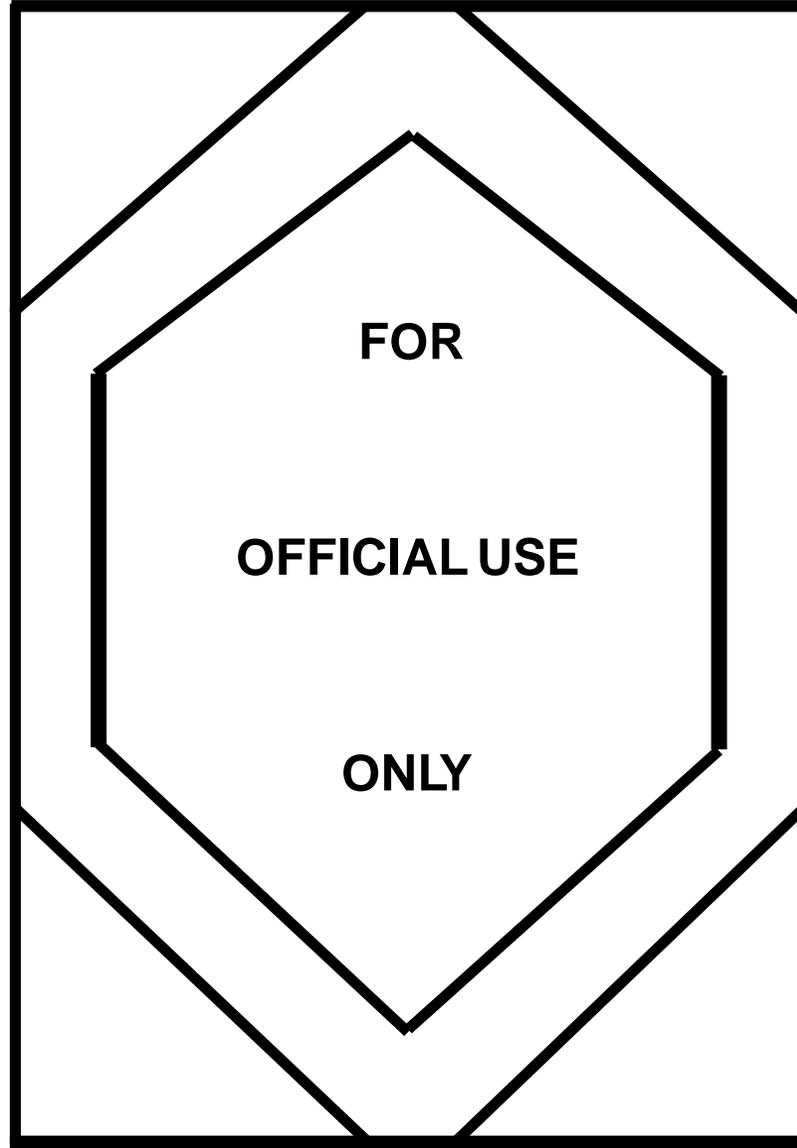
# WORK PACKAGE-FACILITY INVENTORY RECORD



Facility No	Section Category	Section Subtype	QTY	UOM	YEAR	Comments			Location
						Serial No	Capacity	Manufacturer	
J4V-B6015	A105001 STANDARD SLAB ON GRADE	General	6,300	SF	1982				
J4V-B6015	B102001 STRUCTURAL FRAME	Column-Metal	40	LF	1982				
J4V-B6015	B102004 CANOPIES	General	22	SF	1982				
J4V-B6015	B102004 CANOPIES	General	40	SF	1982				
J4V-B6015	B201001 EXTERIOR CLOSURE	Metal Panel	3,756	SF	1982				
J4V-B6015	B201005 EXTERIOR LOUVERS & SCREENS	General	10	SF	1982				
J4V-B6015	B201005 EXTERIOR LOUVERS & SCREENS	General	10	SF	1982				
J4V-B6015	B202001 WINDOWS	Aluminum Windows	29	EA	1982				
J4V-B6015	B203001 SOLID DOORS	Steel	1	EA	1982				
J4V-B6015	B203002 GLASS DOORS	Door, aluminum and glass, without transom, wide stile, double door, hardware, 6ft x 7ft opening	1	EA	1982				
J4V-B6015	B301001 STEEP SLOPE ROOF SYSTEMS	Prefomed Metal	6,300	SF	1982				
J4V-B6015	B301004 FLASHINGS & TRIM	Flashings - Cap	76	LF	1982				
J4V-B6015	B301005 GUTTERS & DOWNSPOUTS	Downspouts	48	LF	1982				
J4V-B6015	B301005 GUTTERS & DOWNSPOUTS	Gutters	152	LF	1982				
J4V-B6015	C101001 FIXED PARTITIONS	Wall - Concrete Block	800	SF	1982				WOMENRR
J4V-B6015	C101001 FIXED PARTITIONS	General	6,800	SF	1982				
J4V-B6015	C102001 STANDARD INTERIOR DOORS	Wood Door/Wood Frame	1	EA	1982				FOYER
J4V-B6015	C102001 STANDARD INTERIOR DOORS	Wood Door/Metal Frame	30	EA	1982				
J4V-B6015	C102001 STANDARD INTERIOR DOORS	General	2	EA	1982				FOYER
J4V-B6015	C103001 COMPARTMENTS, CUBICLES & TOILET PARTITIONS	Toilet Partitions	4	EA	1982				MEN & WOMENRR



# WORK PACKAGE – COST ESTIMATE





# WORK PACKAGE – COST ESTIMATE



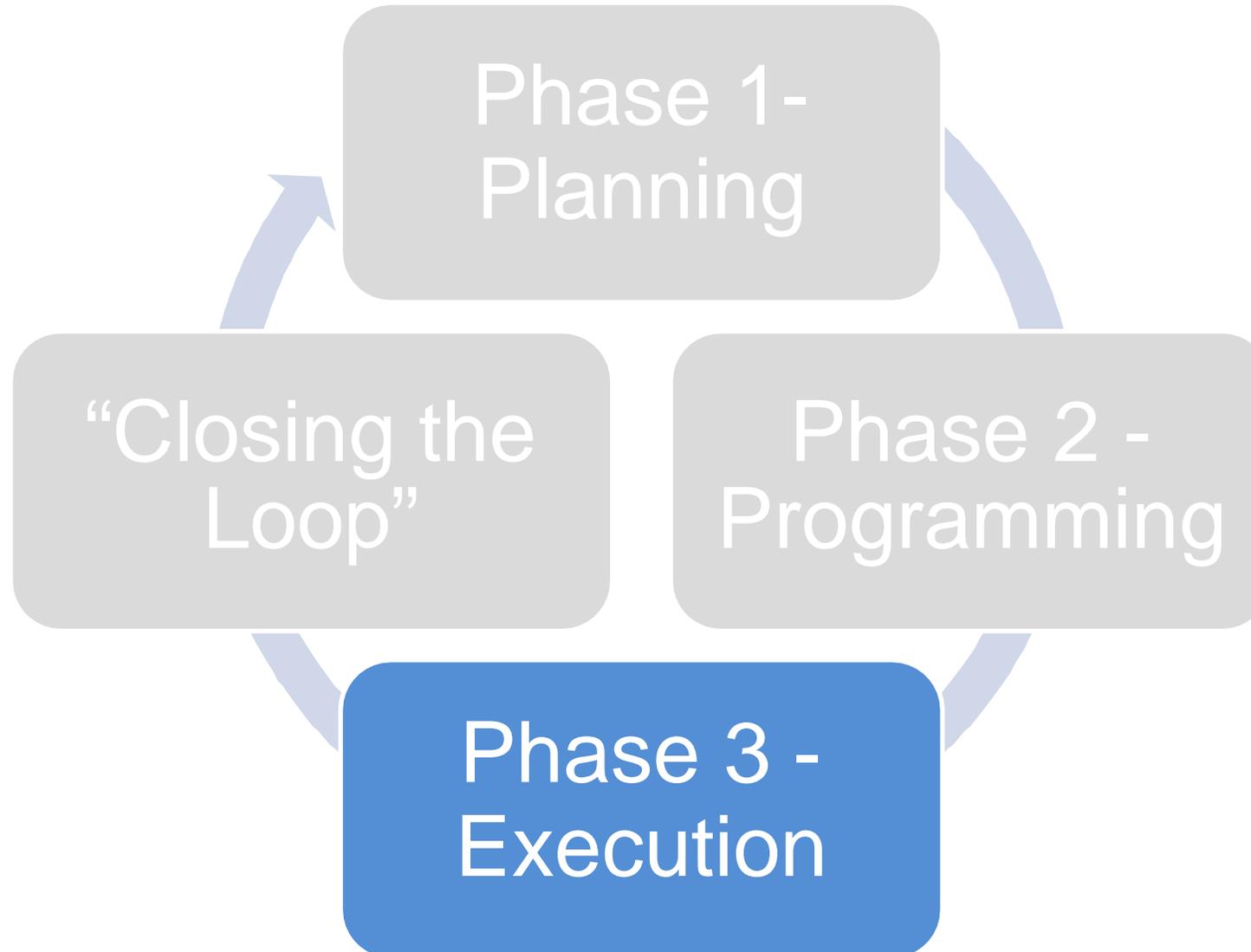
## Bidding Worksheet

(This area reserved for Contracting instructions regarding the Bidding worksheet )

<u>Work Item/Description</u>	<u>Quantity</u>	<u>UOM</u>	<u>UnitCost</u>	<u>Cost</u>
<b>2.3 Facility No. B-6015 - DPW Headquarters Building</b>				
(see description in Section 01 10 00, PART 2.)				
<b>2.3.3.B1020 Roof Construction</b>				
2.3.3.1 B1020 Roof Construction, B102004 Canopies - General	2	EA	\$ 3,304.88	\$ 6,609.75
<b>2.3.3.B2010 Exterior Walls</b>				
2.3.3.2 B2010 Exterior Walls, B201001 Exterior Closure - Metal Panel	3,150	SF	\$ 22.36	\$ 70,436.65
<b>2.3.3.B2020 Exterior Windows</b>				
2.3.3.3 B2020 Exterior Windows, B202001 Windows - Exterior Glazing	29	SF	\$ 2,470.80	\$ 71,653.08
<b>2.3.3.B2030 Exterior Doors</b>				
2.3.3.4 B2030 Exterior Doors, B203002 Glazed Doors - General	3	EA	\$ 4,539.52	\$ 13,618.56
<b>2.3.3.B3010 Roof Coverings</b>				
2.3.3.5 B3010 Roof Coverings, B301003 Roof Insulation & Fill - Rigid Foamed-In-Place/PUF	6500	SF	\$ 4.3	\$ 28,394.62
<b>3. C1010 Partitions</b>				
6.C1010 Partitions, C101001 Fixed Partitions - Wall - Concrete Block	99	SF	\$ 660.91	\$ 65,430.31
7.C1010 Partitions, C101001 Fixed Partitions - Wall - Drywall w/Stud Framing	99	SF	\$ 216.82	\$ 21,465.02
<b>2.3.3.C1020 Interior Doors</b>				
2.3.3.8 C1020 Interior Doors, C102002 Glazed Interior Doors - General	99	EA	\$ 114.50	\$ 11,335.71
<b>3. C1030 Specialties</b>				
9.C1030 Specialties, C103002 Toilet & Bath Accessories - General	6	EA	\$ 1,997.45	\$ 11,984.70
10. C1030 Specialties, C103009 Cabinets - General	10	LF	\$ 657.53	\$ 6,575.26
<b>3. C3020 Floor Finishes</b>				
11. C3020 Floor Finishes, C302005 Carpeting - Carpet Tile	99	SF	\$ 376.96	\$ 37,318.61
12.C3020 Floor Finishes, C302004 Resilient Floor Finishes - Vinyl Tile	99	SF	\$ 51.89	\$ 5,136.76
<b>2.3.3.D2010</b>				
13. D2010 Plumbing Fixtures, D201002 Urinals - General	1	EA	\$ 965.16	\$ 965.16
14. D2010 Plumbing Fixtures, D201001 Waterclosets - General	4	EA	\$ 428.22	\$ 1,712.89



# SRM PROGRAMS - PHASED APPROACH





# PHASE 3 - EXECUTION

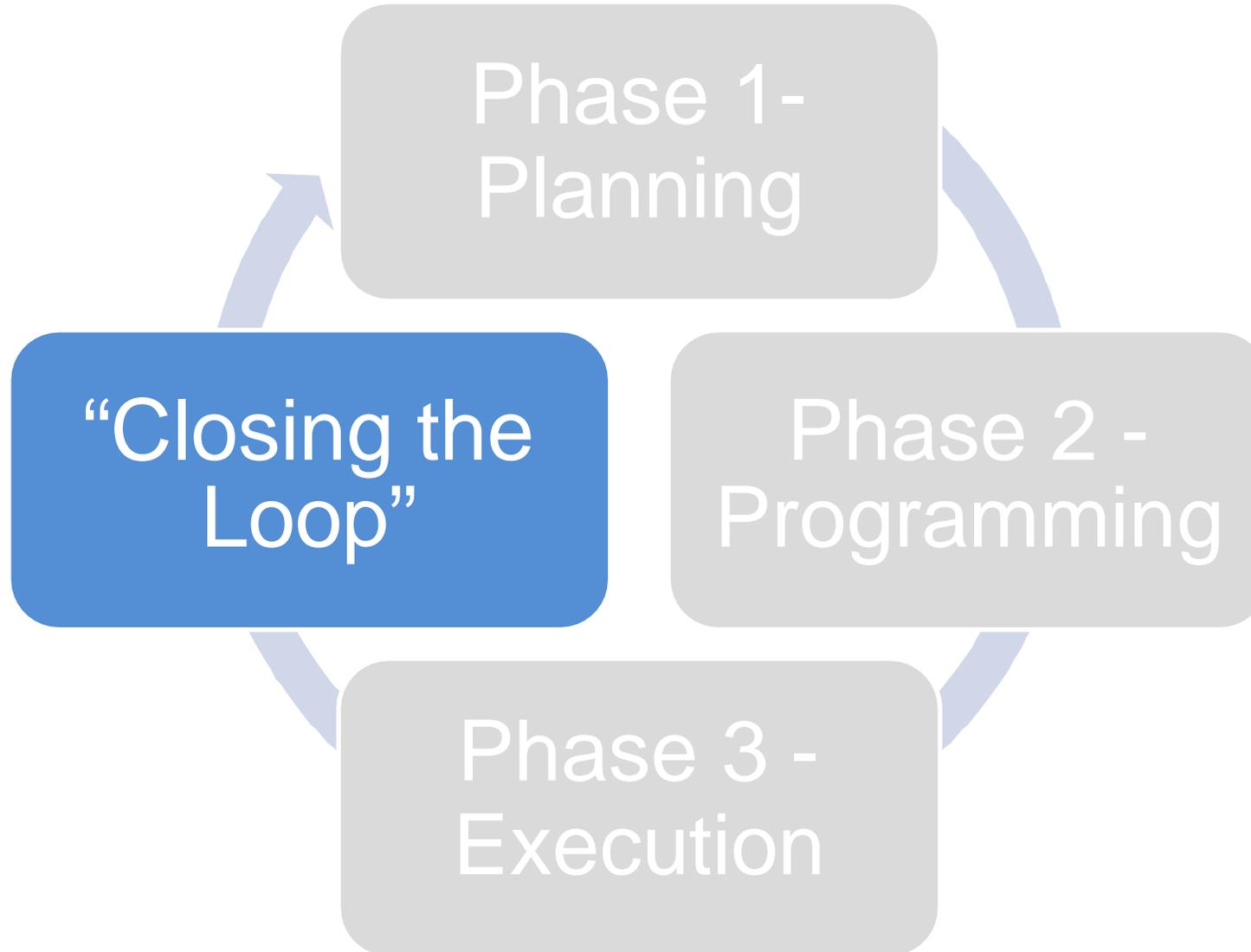


- ❑ Design / Construction
  - Agency-selected Execution Agent
  
- ❑ Coordination of Work Package
  - Work Package could be 90% solution for JOC or Design-Build
  - Work Package great jump start for D-B-B, allowing focused design effort
  
- ❑ Contract Clause for Facility Inventory Record
  - Requires contractor to provide data for BUILDER updates
  - Facilitates accuracy of BUILDER projections between assessment cycles





# SRM PROGRAMS - PHASED APPROACH





# WORK PACKAGE-FACILITY INVENTORY RECORD



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J4V-B6015	C102001 STANDARD INTERIOR DOORS	Wood Door/Metal Frame	30	EA	1982				
J4V-B6015	C102001 STANDARD INTERIOR DOORS	General	2	EA	1982				FOYER
J4V-B6015	C103001 COMPARTMENTS, CUBICLES & TOILET PARTITIONS	Toilet Partitions	4	EA	1982				MEN & WOMENRR



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# BUILDER 101

## Welcome!

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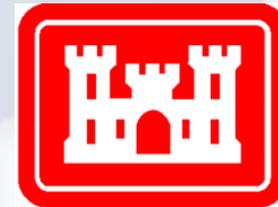
# SMS



# Introductions

- **Name**
- **Where you are from**
- **Where you work**
- **What you do**
- **Experience**
  - **Facility engineering / management**
  - **SMS familiarization:**
    - **Roofer, Railer, Paver, SMS's**
  - **Planning – ISR, GFEBS...**

**Construction  
Engineering  
Research  
Laboratory**



**US Army Corps  
of Engineers®**

**Engineer Research and  
Development Center**



# Why Am I Here?



**BUILDER™**

# Course Objectives

- Understand *why* we use **BUILDER** to manage our assets
- Understand *how* to use **BUILDER**
- Know how **BUILDER** can support the installation's specific needs
- Know where to get help

# Course Requirements

- Ask question when you have it
- Participate in class discussion
- Be willing to learn
- Be willing to instruct



# In This Session

- ✓ Introduction to SMS (Sustainment Management Systems)
- ✓ BUILDER basics; Inventory, Assessment, Condition Indices, Work Planning, and Forecasting
- ✓ Overview of software interface

# What is SMS?

**CERL**

(Construction Engineering Research Lab)

**SMS**

(Sustainment Management System)

ROOFER

PAVER

**BUILDER**

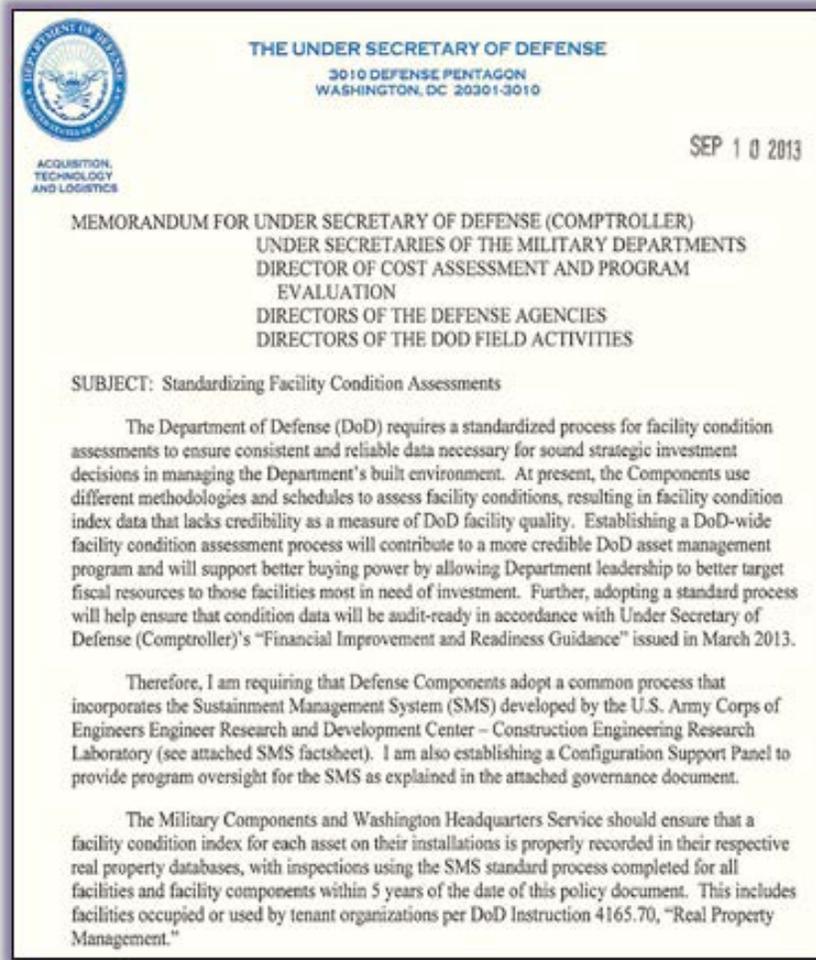
RAILER

Utilities



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# OSD Mandates BUILDER



- “Establishing a DoD-wide facility assessment process”
- “A common process that incorporates the Sustainment Management System (SMS) developed by [CERL]”
- “Ensure that a facility condition index for each asset on their installations is properly recorded in their respective real property databases”



# BUILDER™ SMS

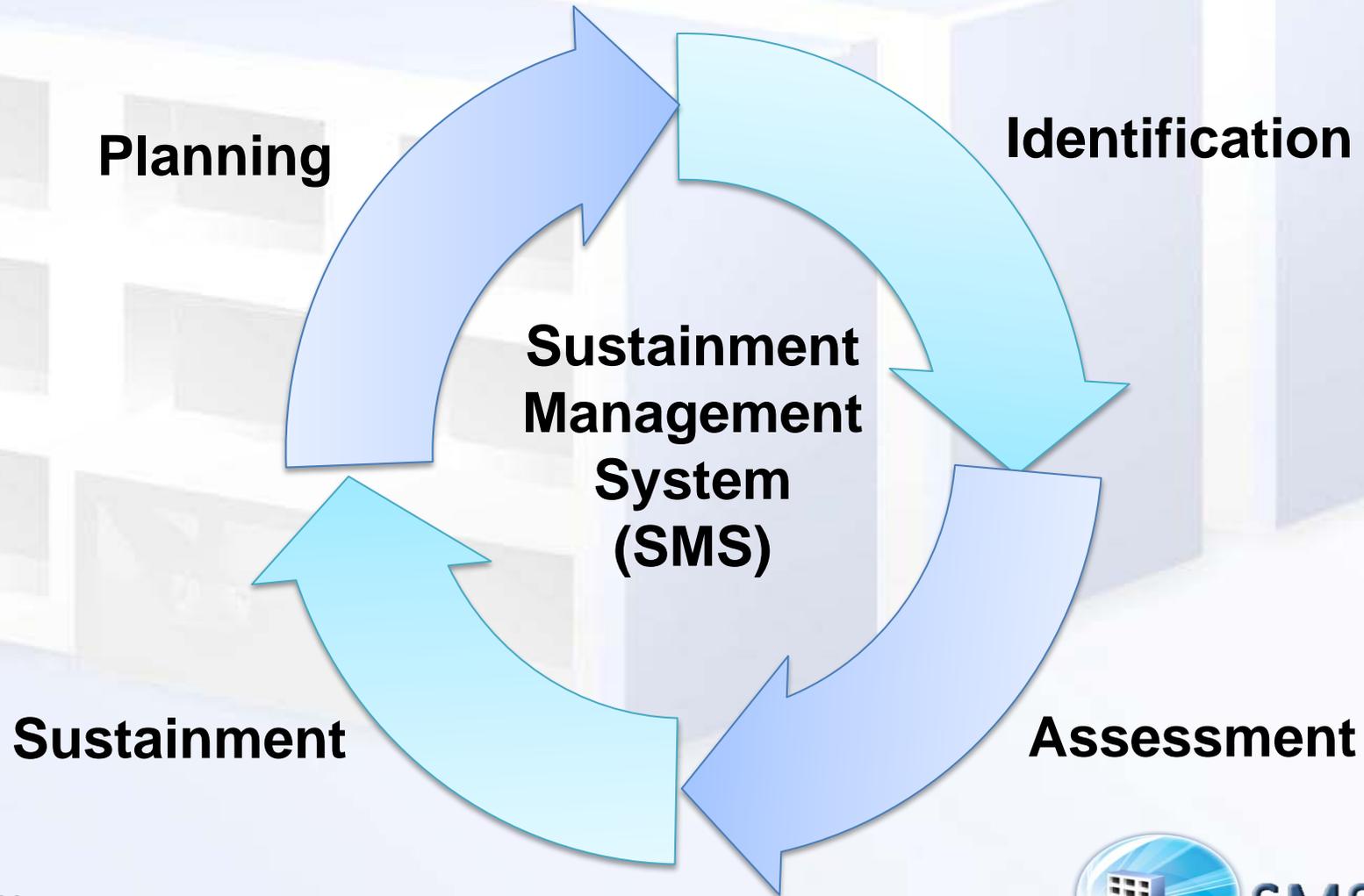
*A Lifecycle Engineering Method Which  
Incorporates Observational Data Collected  
Using a Structured Language and  
Defined Inspection Procedures  
to Determine Asset Condition.*

# Sustainment Management

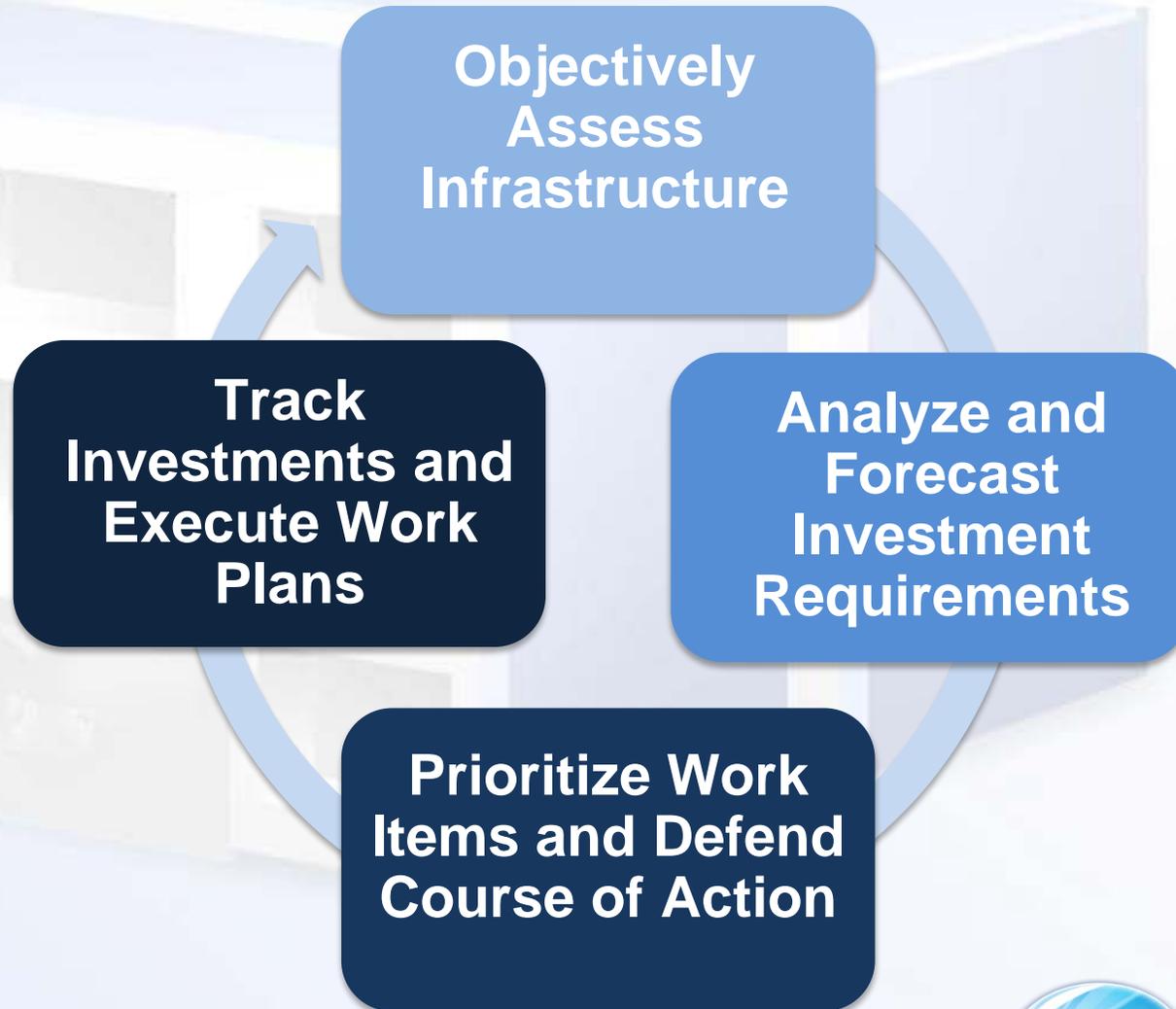
- What do we have
- What condition is it in
- What do we need to do to make it last



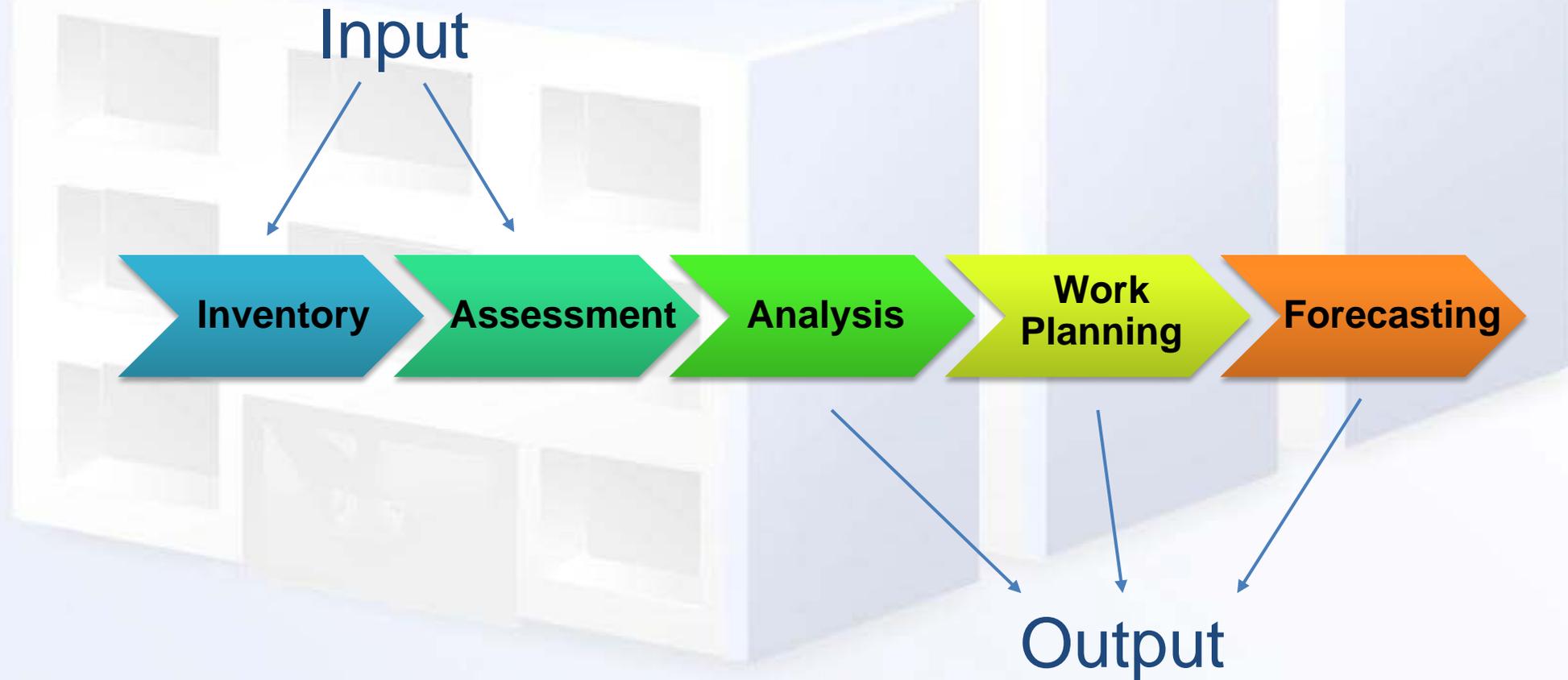
# Sustainment Management



# What is the Goal of **BUILDER**?



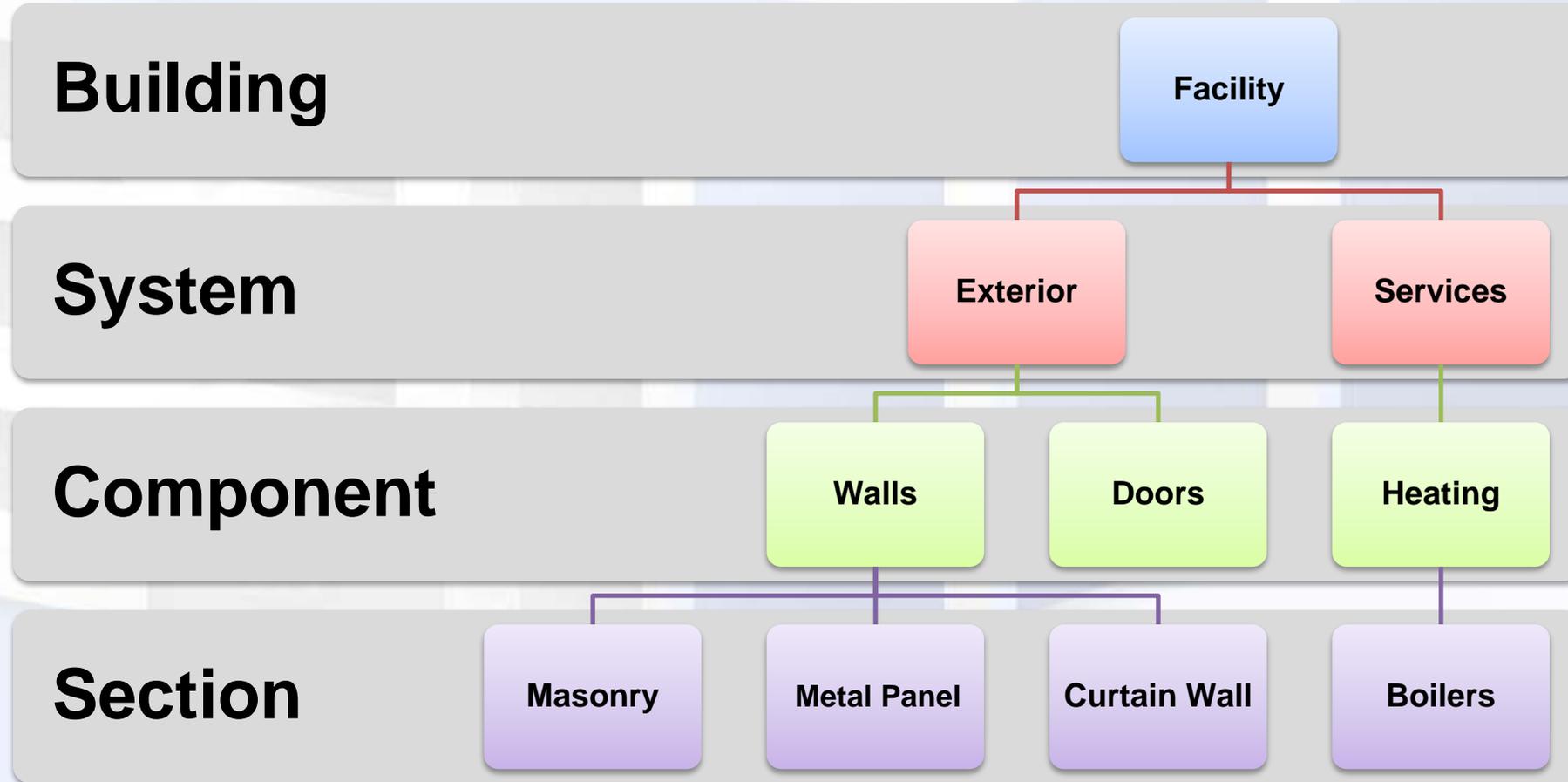
# BUILDER™ SMS – Overview



# Inventory



# BUILDER™ SMS – Inventory

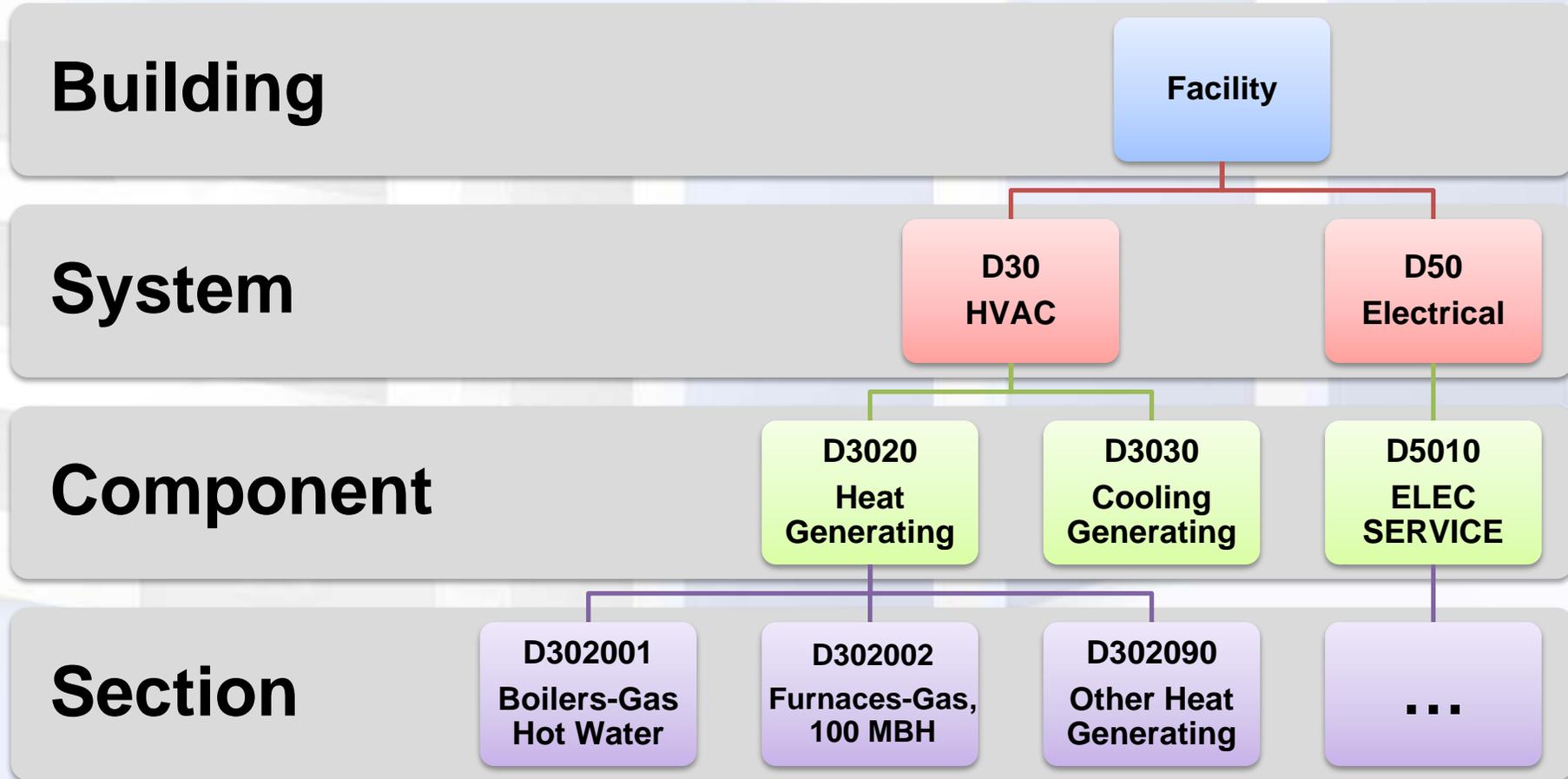


# ASTM – E1557 Uniformat-II

- Hierarchical Organizational Structure; Industry Standard
- Seven Primary Category Levels (A-G)
- Seventeen Primary System Levels (i.e. A10, B20...)

SHELL					
C A T E G O R Y	S Y S T E M	Super Structure			
		B 10			
		Floor Construction			
		B 1010			
		C O M P O N E N T			
		B 101 001	Expansion & Contraction Joints		
		B 101 002	Exterior Stairs & Fire Escapes		SECTIONS
		B 101 003	Floor Raceway Systems		
		B 101 004	Floor Slabs & Decks		
		B 101 005	Floor Structural Frame		
B 101 006	Inclined & Stepped Floors				
B 101 007	Interior Structural Walls & Columns Supporting Floors				
B 101 008	Ramps				
B 101 099	Other Floor Construction				
	Excludes	Exterior Load Bearing Walls - See B 2010, Exterior Walls			
	Excludes	Applied & Suspended Ceiling & Floor Finishes - See C 3020, Floor Finishes & C 3030 Ceiling Finishes			
	Excludes	Stair Construction, See C 2010 - Stair Construction			
	Excludes	Balcony Wall & Railings, See B 2010 - Exterior Walls			

# BUILDER™ SMS – Inventory



# Army is Assessing 14 Systems

1. A10 FOUNDATIONS
2. A20 BASEMENT CONSTRUCTION
3. B10 SUPERSTRUCTURE
4. B20 EXTERIOR ENCLOSURE
5. B30 ROOFING
6. C10 INTERIOR CONSTRUCTION
7. C20 STAIRS
8. C30 INTERIOR FINISHES
9. D10 CONVEYANCE
10. D20 PLUMBING
11. D30 HVAC
12. D40 FIRE PROTECTION
13. D50 ELECTRICAL
14. E10 EQUIPMENT

Inventory	
Condition	
	A10 FOUNDATIONS
	A20 BASEMENT CONSTRUCTION
	B10 SUPERSTRUCTURE
	B20 EXTERIOR ENCLOSURE
	B30 ROOFING
	C10 INTERIOR CONSTRUCTION
	C20 STAIRS
	C30 INTERIOR FINISHES
	D10 CONVEYING
	D20 PLUMBING
	D30 HVAC
	D40 FIRE PROTECTION
	D50 ELECTRICAL
	E10 EQUIPMENT



# Assessments



# SMS – Assessment



# Objective Assessment

- **Trained Assessors Follow A Structured Procedure To:**
  - **Not Provide Opinion/Interpretation**
  - **Identify Defined Distresses and Severity**
  - **Quantify Distresses**
  - **Establishes Extent of Distress**
  - **Record Distress in BUILDER™**
  
- **BUILDER™ Estimates Repair Cost & Priority**

# Two Methods of Condition Assessment

## Direct Rating

- Uses a simple Red, Amber, Green rating (with + and -) to streamline the inspection process when additional detail is not warranted.

## Distress Survey

- A more intensive method. Distresses are selected from a pre-defined list of choices; severity is entered as high, medium, or low, along with a quantity.

# Direct Rating

- Requires less data input
- Single, qualitative rating based on overall condition
- Better suited for initial assessments



# Distress Survey

- Most detailed approach
- Records every type of distress observed on component
- Includes severity and density of distress

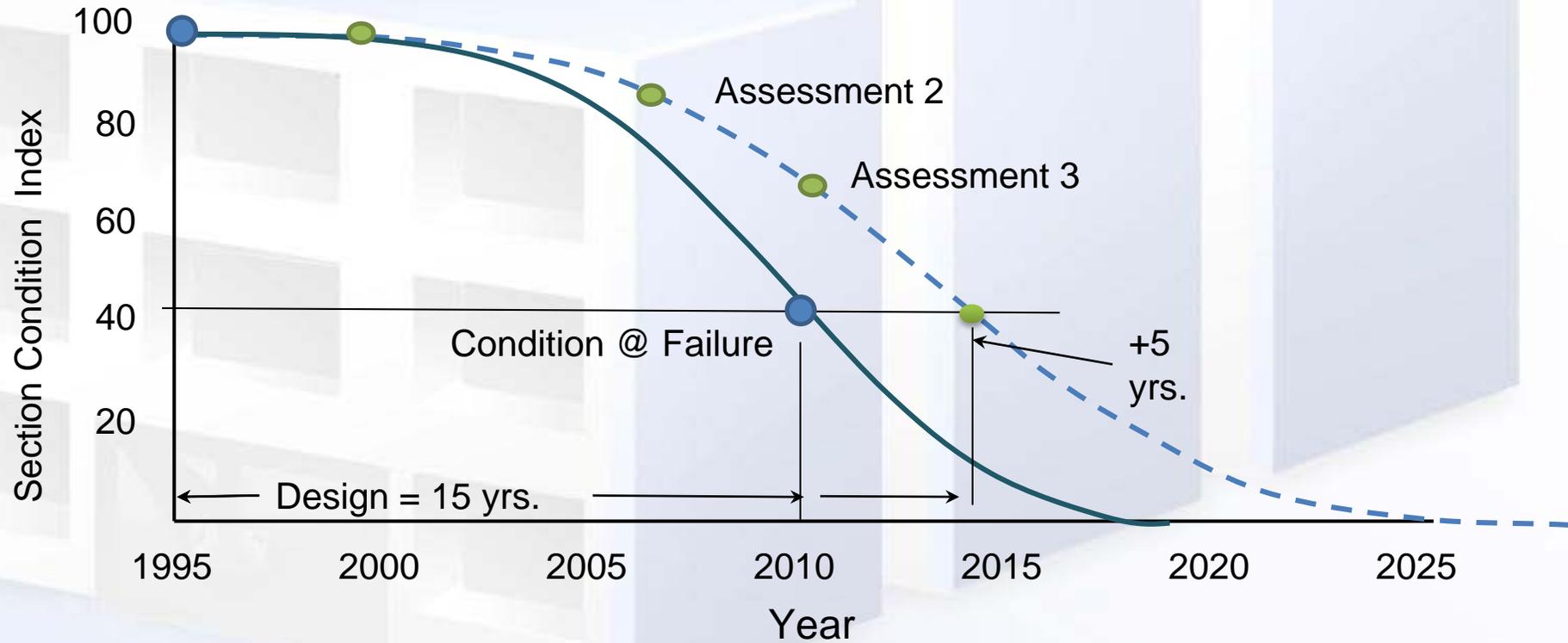


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# Analysis



# Life Cycle Curve Adjustment



# Life Cycle Curve Adjustment

- **BUILDER uses reference expected life cycle values to draw the initial curve**
- **BUILDER will use the assessment to validate and/or adjust the degradation curve**
- **Moves condition along the curve**

# BUILDER Portfolio Rollup

$\Sigma$  Section Condition = Building Condition

- [-] [Shield] CERL - USA\_IMPLEMENTATION
  - [+] [Shield] 00 - 7-9 August 2018- IMCOM-Fort Carson
  - [-] [Shield] 11 - TEMPLATE SITE TO BE COPIED - DO NOT EDIT !
    - [-] [Flag] 01 - SITE TO BE COPIED
      - [-] [House] SNDBX-001 - INVENTORY
        - [+] [Table] 001 - MAINT BLDG - 1959 CONSTRUCTION
        - [+] [Table] 002 - MAINT BLDG - 1976 CONSTRUCTION
        - [-] [Table] 003 - MAINT BLDG - 1990 CONSTRUCTION
        - [+] [L-Shape] A10 FOUNDATIONS
        - [-] [L-Shape] B20 EXTERIOR ENCLOSURE
          - [+] [Sun] B2010 EXTERIOR WALLS
          - [+] [Sun] B2020 EXTERIOR WINDOWS
          - [+] [Sun] B2030 EXTERIOR DOORS
        - [+] [L-Shape] B30 ROOFING
        - [+] [L-Shape] D20 PLUMBING
        - [+] [L-Shape] D30 HVAC
        - [+] [L-Shape] D40 FIRE PROTECTION
        - [+] [L-Shape] D50 ELECTRICAL

# Analysis Results - Indexes

- Analysis Generates:
  - Indexes:
    - **Condition (CI)**
    - Functional (FI)
    - Performance (PI)
  - Work Item / Project Cost:
    - **Facility Condition Index (FCI)**

Metric	Value
CI	62
FI	99
PI	73
FCI	64

Cost Book: NNSA  
Inflation Book: NNSA  
Service Life Book: NNSA  
Policy Sequence: FY18 -  
Prioritization Scheme: FY 16 -

SMS



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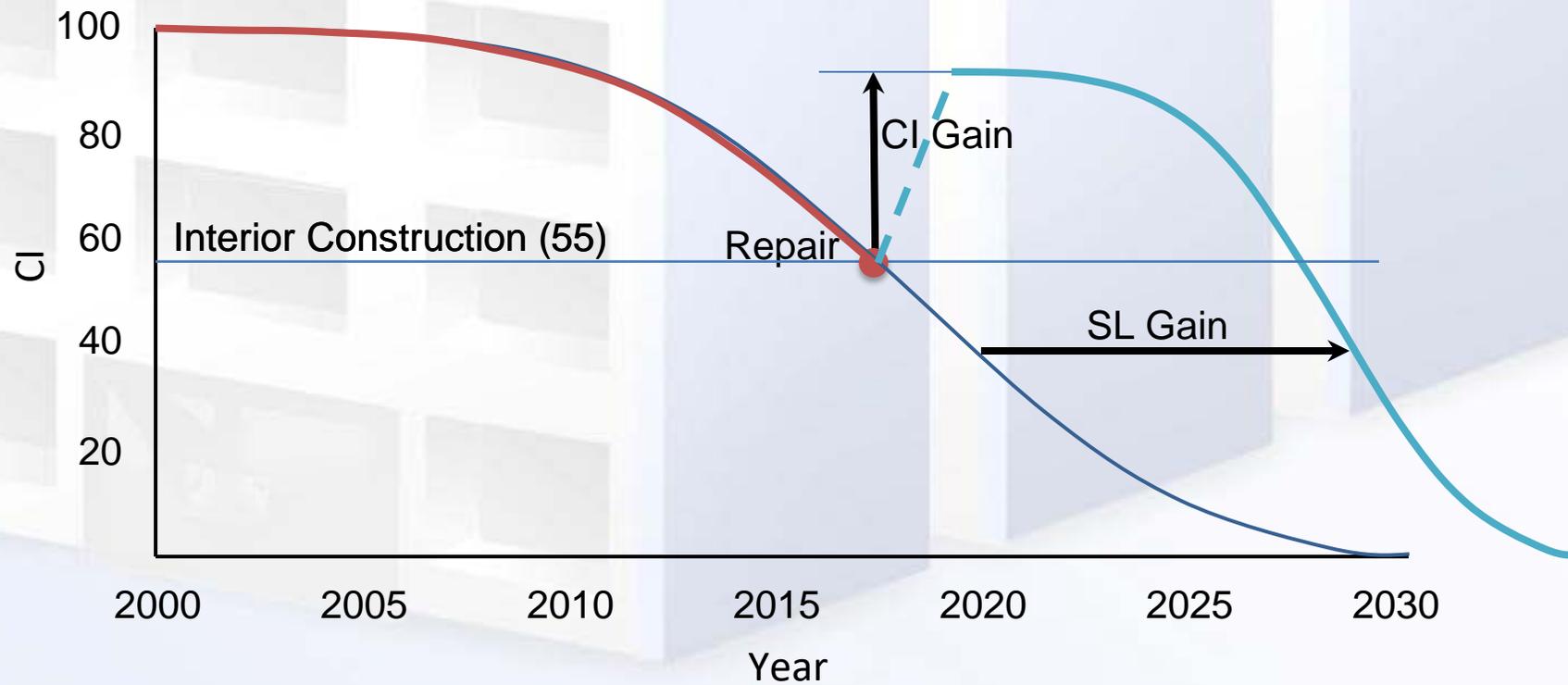
# Work Planning



# **BUILDER™ – Work Planning**

- **Generate Work Items based on Standards and Policies**
  - **Develop Maintenance or Repair Plans**
  - **Modernization or Rehabilitation Plans**
  - **Provides Cost Estimate and ROI**

# Extending Service Life



# BUILDER– Service Life Book

INFOCON: 3 UNCLASSIFIED FPCON: Alpha

https://builder.cecer.army.mil/USAF/Libraries/ServiceLifeManage Service Life Books

File Edit View Favorites Tools Help

Return Save Add Delete

Reference

- USAF - United States Air Force
  - USAF**
  - AFACT - Air Force Active
  - AFGUARD - Air National Guard
  - AFRC - Air Force Reserve Command
  - AMC - AMC Program
  - Training - Organization (DO NOT EDIT)
  - ZZZZ - Training Database - Organization Level

Service Life Book: USAF  
 Level: Component Section  
 System: B30 ROOFING

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Years of Service Life (SL), Paint Life (PL) for System's Components

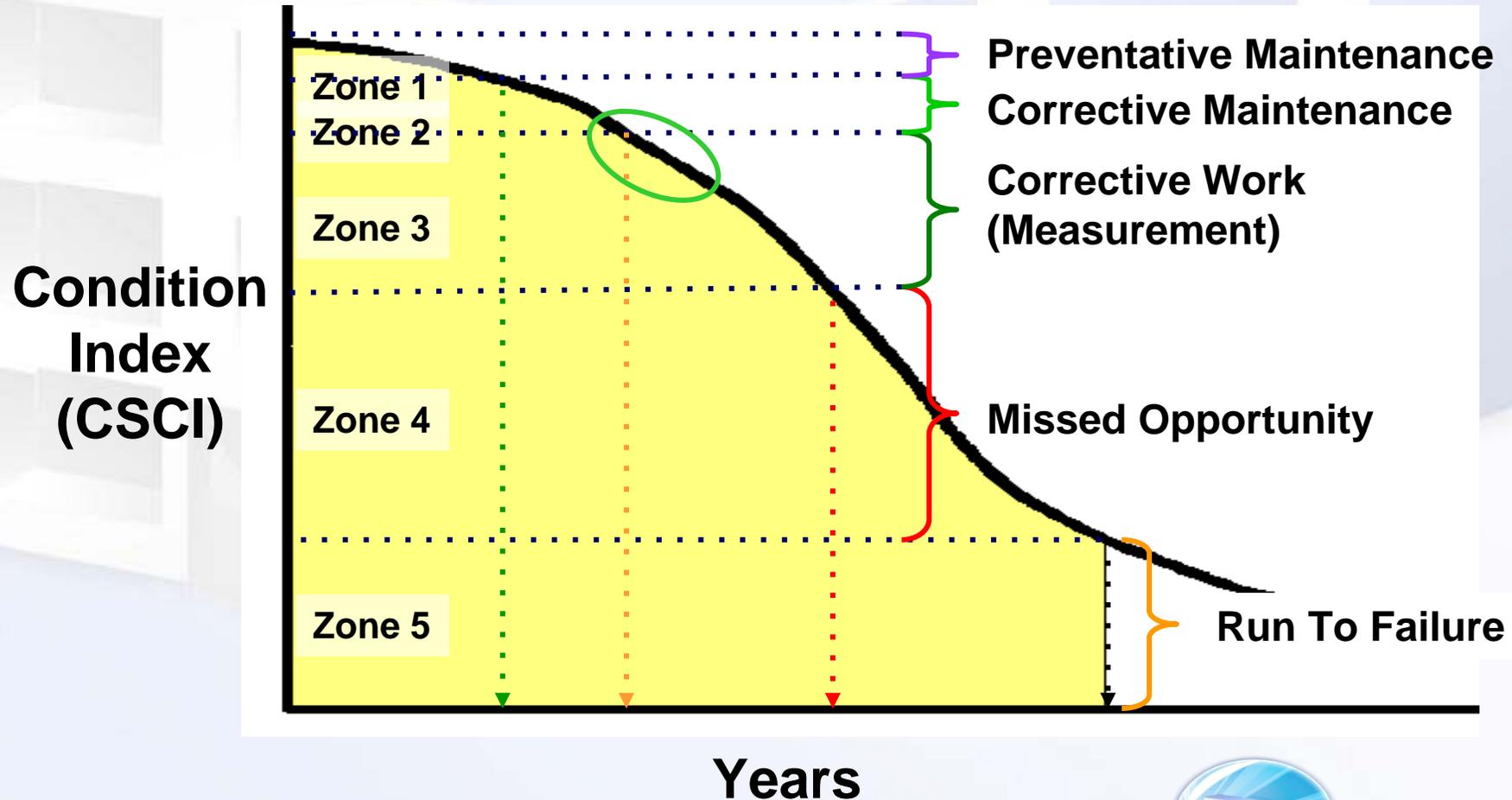
Component	Material / Equipment	Component Type	SL	PL
B3010 ROOF COVERINGS	B301001 STEEP SLOPE ROOF SYSTEMS	Wood Shingles	30	8
B3010 ROOF COVERINGS	B301002 LOW SLOPE ROOF SYSTEMS	General	20	8
B3010 ROOF COVERINGS	B301002 LOW SLOPE ROOF SYSTEMS	Other	20	8
B3010 ROOF COVERINGS	B301002 LOW SLOPE ROOF SYSTEMS	Unknown	20	8
B3010 ROOF COVERINGS	B301002 LOW SLOPE ROOF SYSTEMS	Built-Up	20	8
B3010 ROOF COVERINGS	B301002 LOW SLOPE ROOF SYSTEMS	Liquid Elastomers	20	8

Page size: 50 91 items in 2 pages

100%



# BUILDER – Action Zones



# BUILDER – Standards

The screenshot shows a web browser window with the URL <https://builder.cecer.army.mil/USATraining/Buildings/WorkPlanning/Standards.aspx?ShowWorkExecution=false>. The page header features the logo for "SUSTAINMENT MANAGEMENT SYSTEMS WITH BUILDER" and a security notice: "This information system is approved for UNCLASSIFIED//FOUO data".

Navigation buttons include "Return", "Save", "Add", and "Delete". A search bar is labeled "Search by Name or Number...".

The left sidebar displays a tree view of standards categories:

- 0 - US Army Training
  - Condition Standards
    - 2-Medium**
    - 1-Low
    - 3-High
    - 0- Run to Failure
  - Functionality Standards
  - ARNG - Army National Guard
  - CERL - USA\_IMPLEMENTATION
  - DLA - Sandbox
  - FED - Federal Facility Council

Standard Name:

Work Triggers    Inspection Triggers

Minimum CI for Repair:

Maximum RSL for Replacement:

Minimum CCI for Paint:

Maximum RPL for Paint:

# BUILDER – Policies

https://builder.cecer.army.mil/ - Policies - Internet Explorer provided by USAF

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SUSTAINMENT MANAGEMENT SYSTEMS  
WITH BUILDER

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Return Save Add Delete

USAF - United States Air Force

- Condition Policies
  - USAF
- Functionality Policies
- AFACT - Air Force Active
- AFGUARD - Air National Guard
- AFRC - Air Force Reserve Command
- ZZZT - Test Organization

Policy Name:

Attributes Used to Define Policy

First Attribute:  Third Attribute:

Second Attribute:  Fourth Attribute:

Select Standards for all attribute combinations that apply to this policy.

System	Standard
A10 FOUNDATIONS	Moderate
A20 BASEMENT CONSTRUCTION	Moderate
B10 SUPERSTRUCTURE	Moderate
B20 EXTERIOR ENCLOSURE	Moderate
B30 ROOFING	Elevated
C10 INTERIOR CONSTRUCTION	Low
C20 STAIRS	Moderate
C30 INTERIOR FINISHES	Low
D10 CONVEYING	Low
D20 PLUMBING	Low
D30 HVAC	High
D40 FIRE PROTECTION	High
D50 ELECTRICAL	High
E10 EQUIPMENT	
E20 FURNISHINGS	
F10 SPECIAL CONSTRUCTION	



# BUILDER SMS – Work Planning

https://builder.cecer.army.mil/ - Work Plan - Internet Explorer provided by USAF

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SUSTAINMENT MANAGEMENT SYSTEMS WITH BUILDER

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Return Generate Items Prioritize Rankings Fund Items Reports

USAF - United States Air Force

- AFAC - Air Force Active
- AFRC - Air Force Reserve Command
- ZZZT - Test Organization
- AFCEC CMD - AFCEC-East - Command Le
  - AFCEC-BGH - Demonstration Installat
    - 00001 - Base HQ
    - 00002 - Alert Hanger**
    - 00003 - Fire Station
    - 00004 - Family Services Center
    - 00005 - Fitness Center
    - 00006 - Mission Crew Training
    - 00007 - Base Comm
    - 00008 - Security Operations
    - 00009 - Avionics Shop
    - 00010 - VEQ
  - AFCEC-DB - Database for BRED Uploa
- Z - Buddy
- ZZZZ - Test Location 2
- ZZZZ - Test Location Z

FY 2013 Add Export

Work Plan Items Projects Budget Summary

Drag a column header and drop it here to group by that column

Details	Name	Asset	Description	Cost	Status	Score	Date
<a href="#">Replace</a>	00002 - Alert Hanger	FL2-1997 D502002 LIGHTING EQUIPMENT General	Replace D5020 LIGHTING & BRANCH WIRING FL2-1997 D502002 LIGHTING EQUIPMENT General	\$194,000	Awaiting Funds	80.00	
<a href="#">Replace</a>	00002 - Alert Hanger	FCU1_1997_ENTRANCE D305003 FAN COIL UNITS Cab Mount, Two Pipe	Replace D3050 TERMINAL & PACKAGE UNITS FCU1_1997_ENTRANCE D305003 FAN COIL UNITS Cab Mount, Two Pipe	\$4,650	Awaiting Funds	80.00	
<a href="#">Replace</a>	00002 - Alert Hanger	AHU1_1997_MECHFL1 D304008 AIR HANDLING UNITS Central Station - 2000 CFM	Replace D3040 DISTRIBUTION SYSTEMS AHU1_1997_MECHFL1 D304008 AIR HANDLING UNITS Central Station - 2000 CFM	\$19,500	Awaiting Funds	80.00	
<a href="#">Replace</a>	00002 - Alert Hanger	FCU2_1997_EACH_RM_FL D305003 FAN COIL UNITS DX	Replace D3050 TERMINAL & PACKAGE UNITS FCU2_1997_EACH_RM_FL1 D305003 FAN COIL UNITS DX	\$140,000	Awaiting Funds	80.00	
<a href="#">Replace</a>	00002 - Alert Hanger	FL1-1997 D503005 SECURITY SYSTEMS General	Replace D5030 COMMUNICATIONS & SECURITY FL1-1997 D503005 SECURITY SYSTEMS General	\$13,500	Awaiting Funds	80.00	
<a href="#">Replace</a>	00002 - Alert Hanger	FCU3_1997_EACH_RM_FL D305003 FAN COIL UNITS DX	Replace D3050 TERMINAL & PACKAGE UNITS FCU3_1997_EACH_RM_FL2 D305003 FAN COIL UNITS DX	\$108,000	Awaiting Funds	80.00	
<a href="#">Replace</a>	00002 - Alert Hanger	CWP1_1997_MECHFL1 D304006 CHILLED WATER DISTRIBUTION SYSTEMS Circulating Pump, End Suction	Replace D3040 DISTRIBUTION SYSTEMS CWP1_1997_MECHFL1 D304006 CHILLED WATER DISTRIBUTION SYSTEMS Circulating Pump, End Suction	\$21,500	Awaiting Funds	80.00	
<a href="#">Replace</a>	00002 - Alert Hanger	CRU1_1997_COMPRM D305006 PACKAGE UNITS A/C Unit.	Replace D3050 TERMINAL & PACKAGE UNITS CRU1_1997_COMPRM D305006 PACKAGE UNITS A/C Unit, Computer Room	\$50,000	Awaiting Funds	80.00	

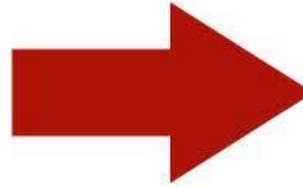
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# Standards & Policies

Inventory 



Condition Assessment Survey 



set **STANDARDS**  
*Condition Index thresholds for:*  
 Work Triggers  
 Inspection Triggers



generate **WORK ITEMS**

set **POLICIES**  
*Apply the STANDARDS to specific inventory attributes such as:*  
 System Type, Building Use Type, etc..



Name	Description
103 - RECREATION CENTERS	Replace 02010 Plumbing Fixtures Service Sink Metal, including critical distr
01 - GENERAL WAREHOUSE	Replace 02010 Plumbing Fixtures Urinal Ceramic
01 - GENERAL WAREHOUSE	Replace 02010 Plumbing Fixtures Lavatory Sink Ceramic
01 - GENERAL WAREHOUSE	Replace 02010 Plumbing Fixtures Toilet Ceramic
01 - GENERAL WAREHOUSE	Replace 82030 Exterior Doors Metal Overhead
05 - BATTALION HQ	Replace 83010 Roof Coverings Metal Exterior - Roof Drainage
08 - CHAPEL	Replace 02010 Plumbing Fixtures Toilet Ceramic
08 - CHAPEL	Replace 02010 Plumbing Fixtures Service Sink Ceramic
105 - TEMP QUARTERS	Replace 02010 Plumbing Fixtures 3FL Service Sink Metal
105 - TEMP QUARTERS	Replace 02010 Plumbing Fixtures 3FL Lavatory Sink Ceramic
105 - TEMP QUARTERS	Replace 02010 Plumbing Fixtures 3FL Urinal Ceramic
11 - LIBRARY	Replace 83010 Roof Coverings Metal Exterior - Roof Drainage
12 - ADMIN TRNG BLOG	Replace 83010 Roof Coverings Main Roof & Canopies Aluminum Gutter



apply **PRIORITIZATION**  
*Rank generated Work Items*  
 ● Fundamental Objectives  
 📄 Measures

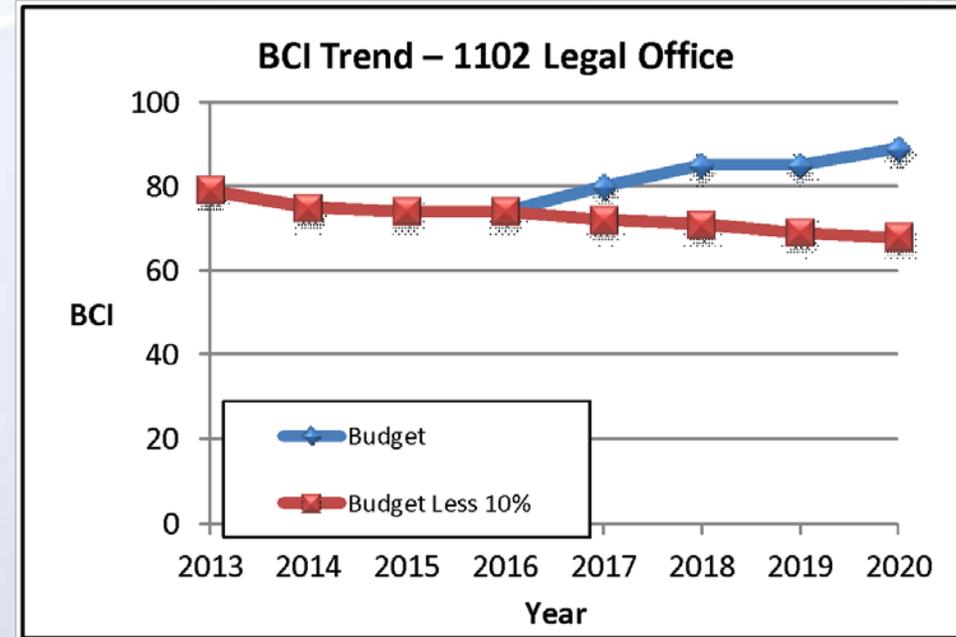


# Forecasting



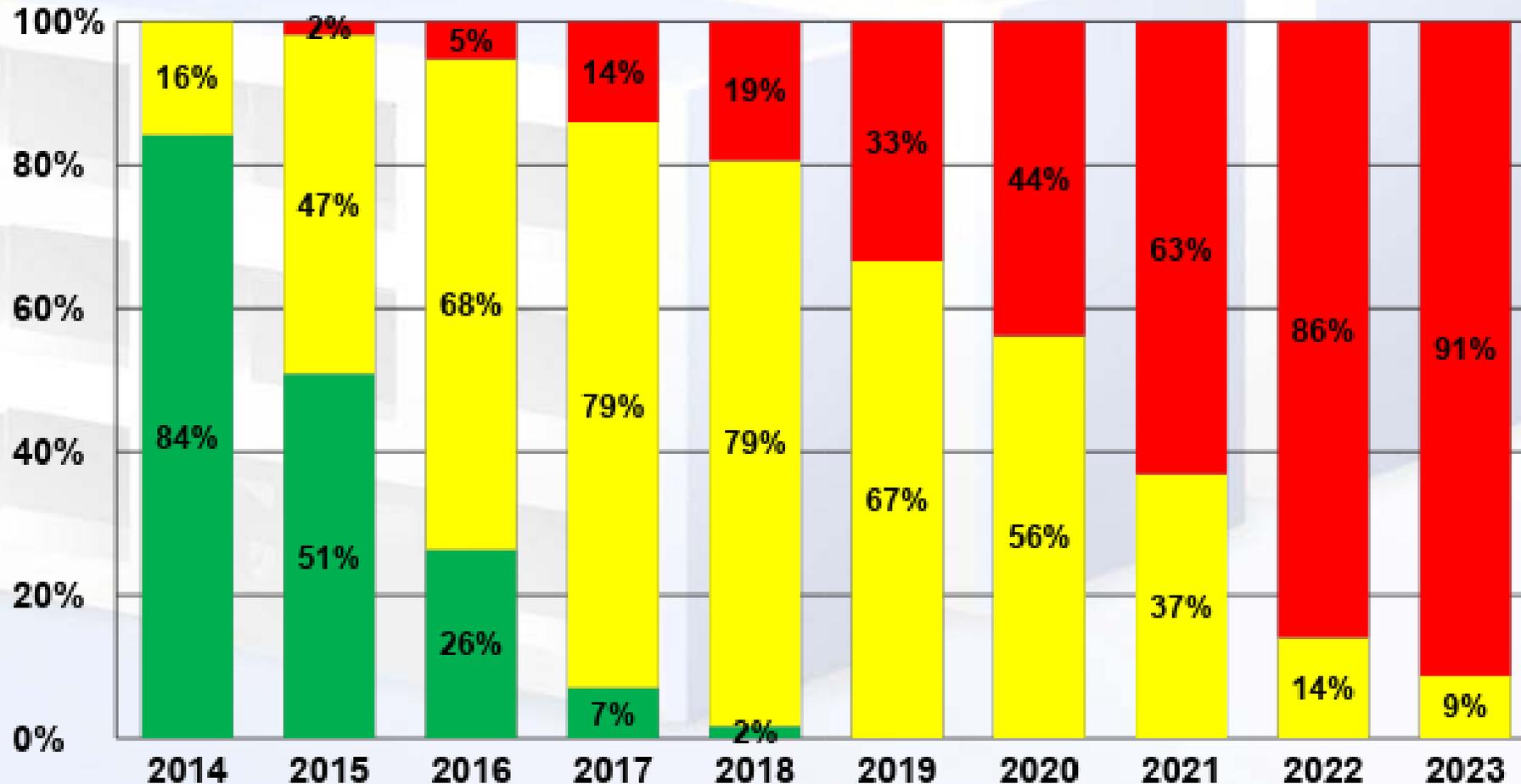
# Forecasting: Consequence Analysis

- Similar to annual work planning, but for multiple years
- Scenarios based on funding (ROI and budget) and standards and policies
- Simulate the long-term impact on condition, performance, and estimated backlog
- Evaluate different scenarios (budgets, policies, prioritization schemes, etc.)



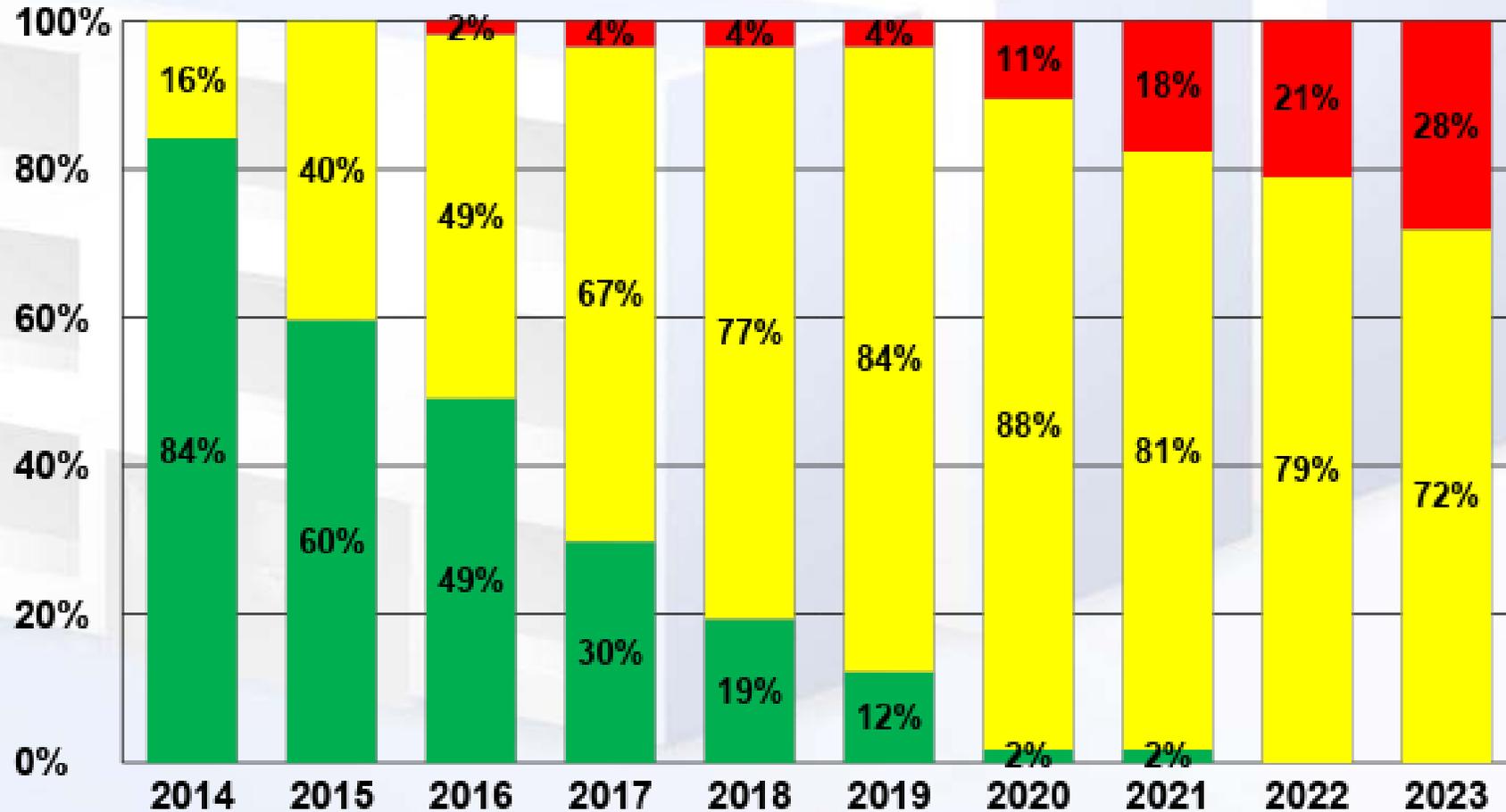
# BUILDER SMS – Forecasting

No Funding  
CI Impact by Year



# BUILDER SMS – Forecasting

With 1.5% Funding  
CI Impact by Year



# The Results

- Better management of our infrastructure
  - ✓ Systematic, objective, efficient
  - ✓ Mission ready infrastructure
  - ✓ Prioritized use of scarce resources
  - ✓ Avoidance of future shocks
  - ✓ Realistic, defensible budget projections
    - Avoidance of long-term penalties
    - Awareness of the consequences of today's decisions
- BUILDER database is a living entity

**Gather the right data at the right time at the right level**



# BUILDER Orientation

# BUILDER System

**SUSTAINMENT MANAGEMENT SYSTEMS WITH BUILDER**

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Work Configuration | **Work Plan** | **Scenarios** | Reports | Tools

**Inventory**

- USA - US Army
  - ARNG - Army National Guard
  - USA - Army Active
    - AMC - Army Material Command
    - IMCOM - Installation Management Command
      - AT - Atlantic Region
        - 01202 - Redstone Arsenal
        - 01252 - Fort Rucker
        - 1281A - USAG Miami
        - 13025 - Fort Benning
        - 13055 - Fort Gordon
        - 13305 - Fort Stewart
        - 21145 - Fort Campbell
          - Not in Pilot
          - Pilot SOW
            - [00039] - [07120]
            - [07138] - [07170]
            - 07138
            - 07146 - 19TH ASOS**

**Condition**

Functionality

Save | Comment | **Reports** | 21145 - Fort Campbell | Pilot SOW | 07146 - 19TH ASOS

Building No: 07146 | Building Name: 19TH ASOS

General Info | Additional Info | Assess. History | Work Item History | Systems at a Glance | Attachments (1)

Building Use: 61050 - ADMIN GEN PURP

Building Type:

Current Status: Active

Construction Type: Permanent

Area: 36,275 SF

Year Constructed: 2002

Number of Floors: 1

ISR Rating:

Replacement Cost: \$9,942,673

Check box to override automated updates and manually enter replacement cost:

Mission Dependency Index

MDI:

Check box to override automated updates and manually enter MDI:

Status

Historic

Child-Occupied Facility

Condition

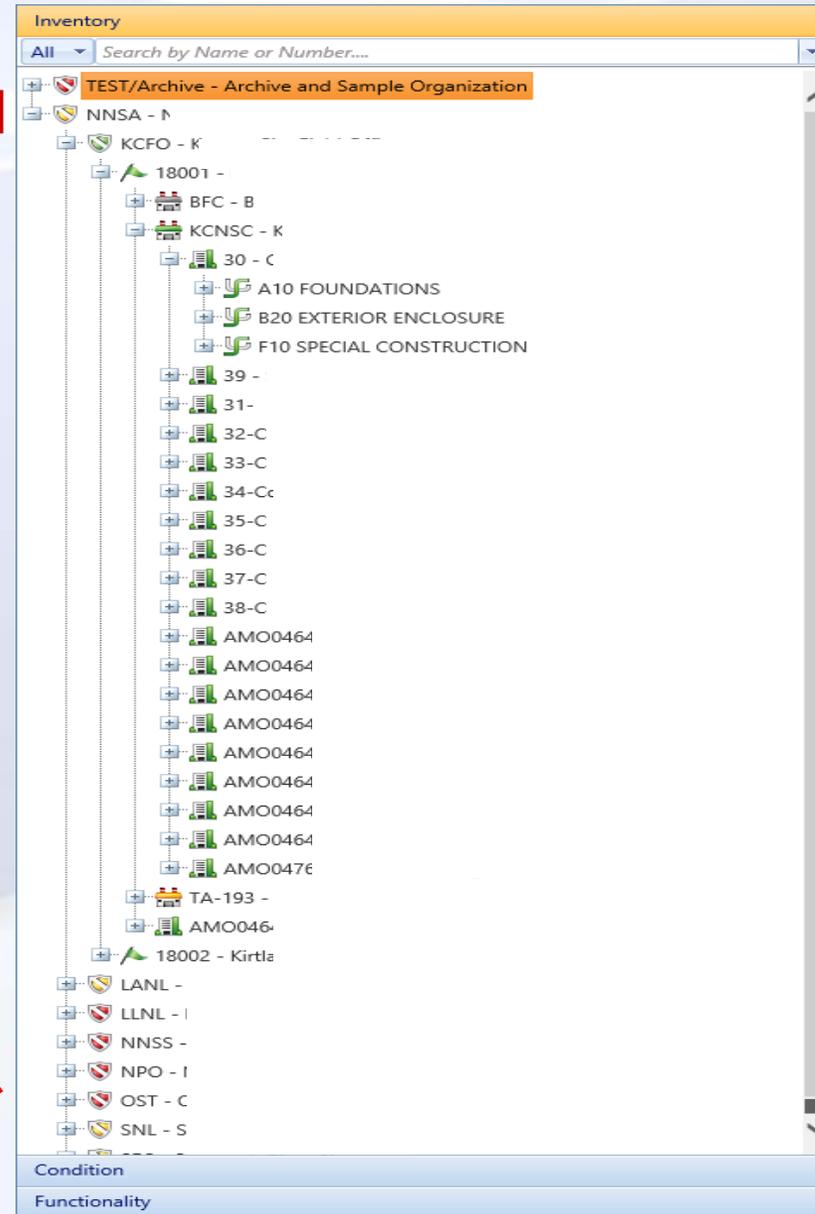
Metric	Value
BCI	94
BFI	100
BPI	98
FCI	98.209

Functionality

Issue	Rating
Location	N/A
Cultural Resources	N/A
Building Size and Configuration	N/A
Structural Adequacy	N/A
Access	N/A

# Navigation

- The **Navigation Tree** displays the facilities hierarchy by Organization, Site, Complex, and Building
- The **Navigation Ribbon** below the Navigation Tree has tabs for Inventory, Condition, and Functionality
- These are the most important areas for moving around the website



# BUILDER Orientation

<https://builder.cecer.army.mil/usatraining>

https://builder.cecer.army.mil/DHA/Login.aspx?ReturnUrl=%2FDHA%2FLogin

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Accept

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<p>Sign in using your BUILDER login</p> <p>User Name: <input type="text"/></p> <p>Password: <input type="password"/></p> <p><input type="button" value="Login to BUILDER *"/></p>	<p>Sign in using your CAC</p> <p>Insert your CAC into your card reader</p> <p><a href="#">First time CAC user, click here</a></p> <p><input type="button" value="Log in with CAC *"/></p>
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7,734,488  
7,769,568



# Questions and Discussion





U.S. ARMY

# FALL 2019 BUILDER SUMMIT

Day 2 – Thursday

15 August, 2019

National Academies of Sciences, Engineering, and Medicine  
500 5th Street Northwest  
Keck Center Room 100  
Washington, DC 20001



US Army Corps  
of Engineers



DISCOVER | DEVELOP | DELIVER

# Wednesday Recap

- Senior Leader Insights
- NNSA Case Study
- Implementation Panel Discussion
- BUILDER 3.5 Retrospective

## **BREAKOUT SESSIONS Recap**

*Recordings did not work, WebEx storage overloaded.*

Functionality / Work Validation & Packaging

BUILDER 101

Utilities Working Committee

# Agenda Review Cont.

## Thursday

### MORNING SESSIONS

- 8:00 AM—8:30 AM [Tuesday Recap—Breakout Session Re-cap](#)
- 8:30 AM—9:30 AM [Enterprise SMS & VTIME Update/Demonstrations](#)
- 9:30 AM—9:45 AM BREAK
- 9:45 AM—11:00 AM [Updating BUILDER Cost Catalog – NNSA Case Study](#)
- 11:00 AM—11:30 AM [BUILDER Development Roadmap](#)
- 11:30 AM—1:00 PM LUNCH

### BREAKOUT SESSIONS

- Session 1A: 1:00 PM—2:30 PM* Intro to Using PowerBI with BUILDER Data
- Session 1B: 1:00 PM—2:30 PM* EquipMapper Data Migration Utility
- Session 1C: 1:00 PM—2:30 PM* Dams Working Committee
  
- Session 2A: 2:30 PM—4:00 PM* BUILDER Assessment Quality Assurance
- Session 2B: 2:30 PM—4:00 PM* Systems Integration – BUILDER API Workshop
- Session 2C: 2:30 PM—4:00 PM* IC Discussion

# Enterprise SMS and VTIME/FIA Update

# *Contracted Development Efforts*

## **FY18 Contracts**

- Fuels - Cross Platform Improvement (**Completed**)
- Utilities – Work Analysis Engine (**Completed**)
- Utilities – Work Planning User Interface (**Completed**)
- Utilities – Integrated Business Intelligence Suite (**Completed**)



# *Contracted Development Efforts*

## **FY19 Contracts**

- Fuels – Workflow Capabilities
- Utilities – ArcGIS Import
- Buildings – API-based BUILDER Inventory Import
- Pavements – API-based PAVER E70 file import



# ESMS Update (engineering)

## **Nearing Milestones**

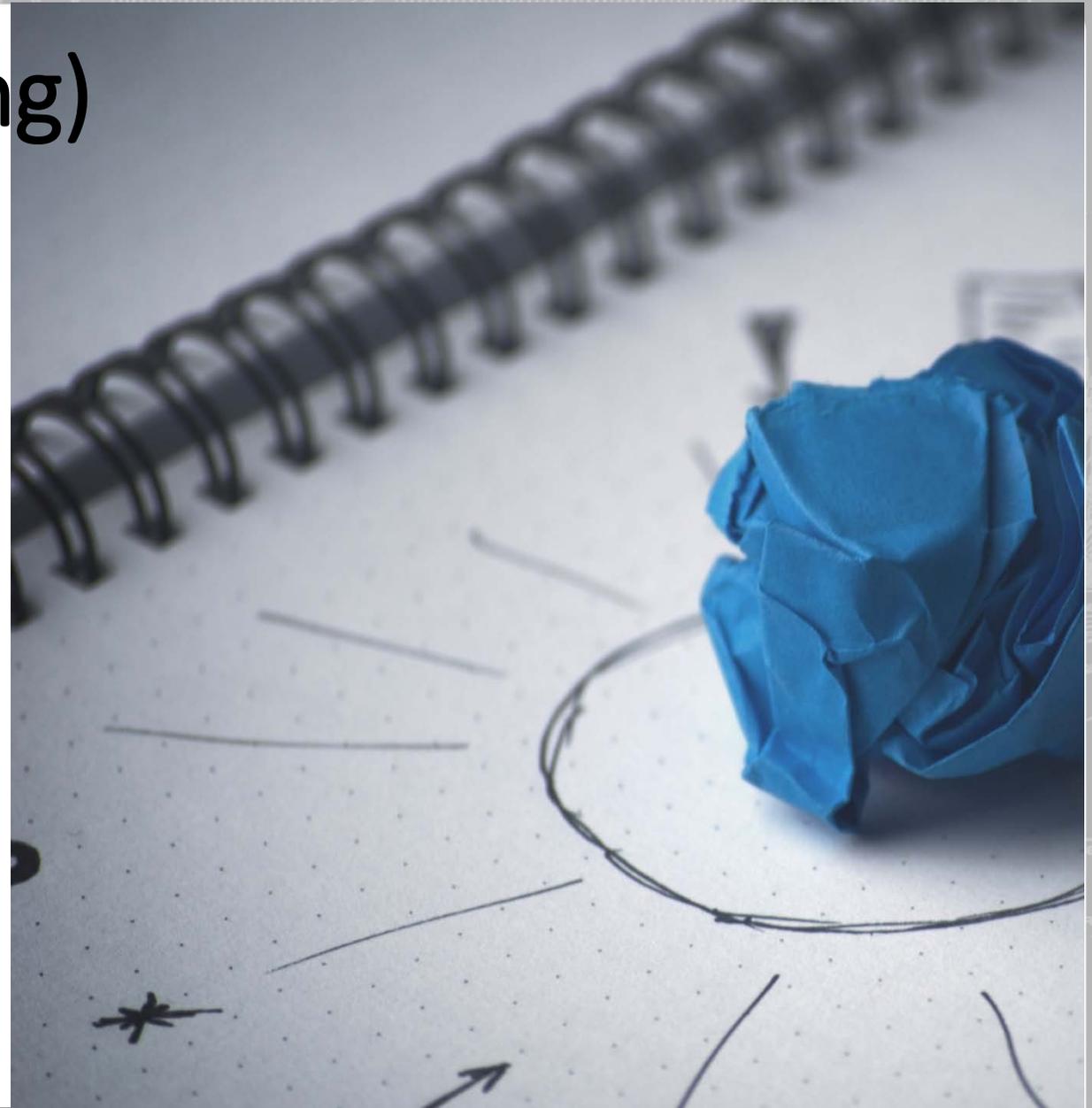
- Fuels Engineering Criteria via Functional Assessments
- Pilot Assessments at Offutt Air Force Base
- Engineering IDIQ MATOC award

## **Short-Term Milestones**

- SMS engineering data peer-review/validation
- SMS engineering data gap analysis

## **Long-Term Milestones**

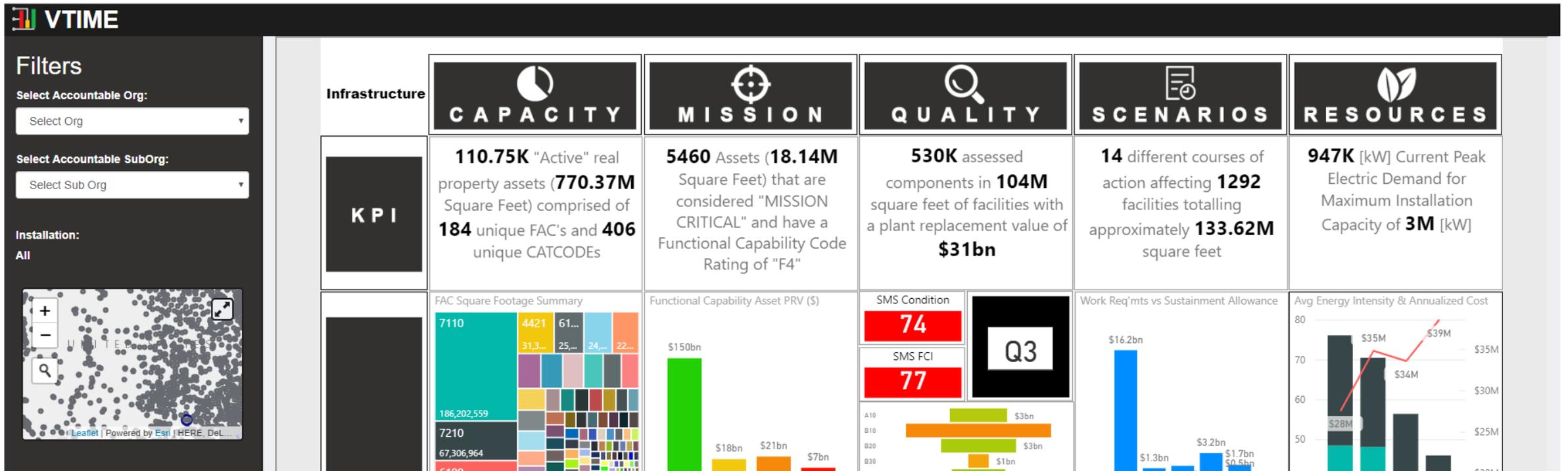
- Lifecycle characteristics and modeling for remaining FACs



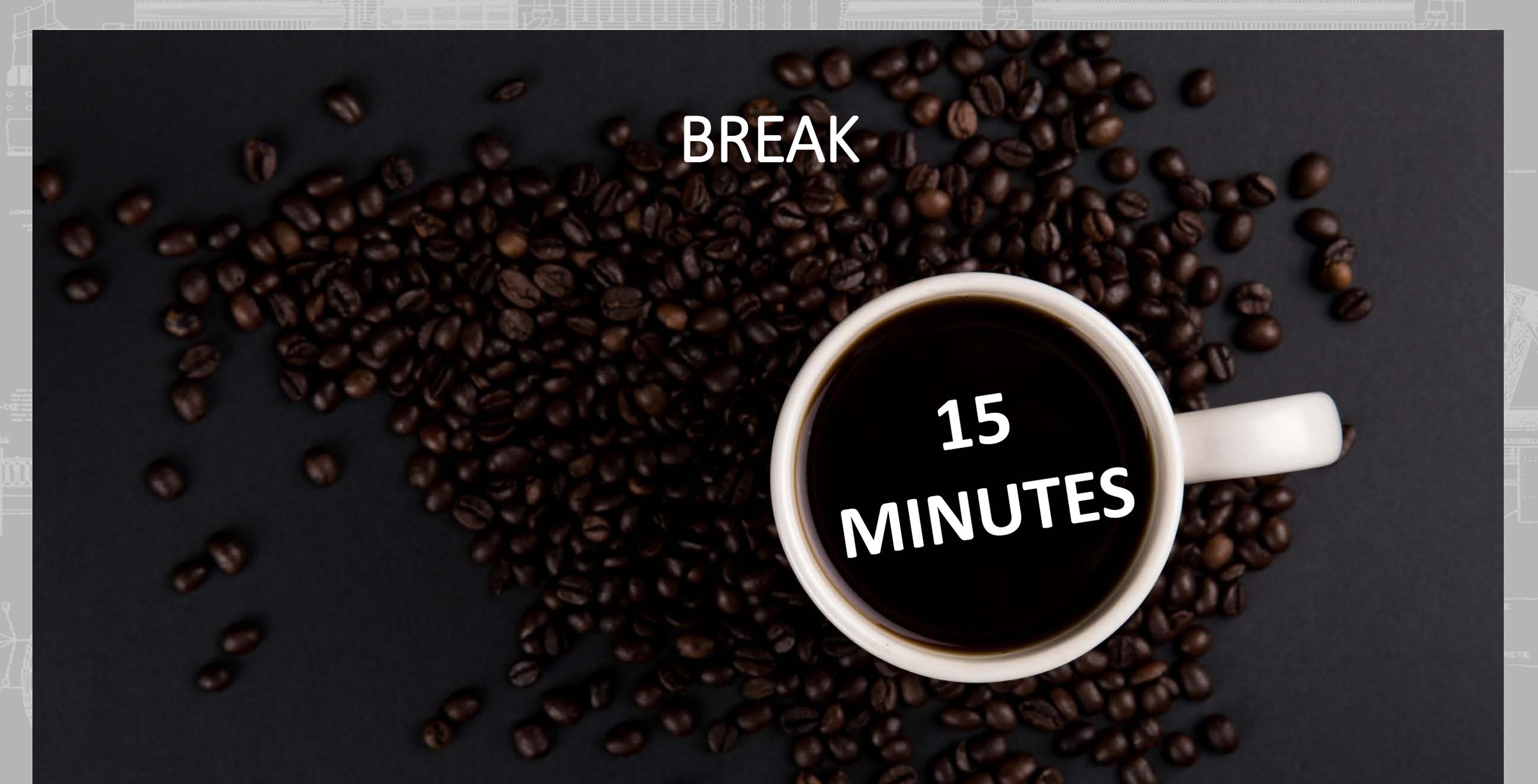
# Enterprise SMS Demonstration

# VTIME/FIA Update

- Demonstration of VTIME capabilities shown to Army Senior Leadership
- Well received!
- Army utilizing VTIME capabilities for FY22-26 POM
- Effort name Facility Investment Analytics (FIA) – PowerBI Reports Only



# VTIME Demonstration



**BREAK**

**15  
MINUTES**



# NNSA & GORDIAN BUILDER™ Project Case Study



# Introductions



**Julie Krebs**

**BUILDER™ SMS Program Analyst,  
Office of Infrastructure  
Planning & Analysis**

National Nuclear Security  
Administration (NNSA)



**Joe Kelble**

**Senior Engineer  
Gordian**



**Dale Flamm**

**Software Developer  
Gordian**



**Mike Bartoli**

**Federal Solutions  
Account Manager  
Gordian**

# Agenda

- NNSA Infrastructure Mission Challenges and Objectives
- BUILDER™ Objectives
- Project Scope:
  - BUILDER™ Cost/Catalog Update
  - BUILDER™ Cost Engine
- Project Results
- Questions and Discussion - NNSA Solution
- CRADA - RSMMeans data Cost Book for BUILDER™

# NNSA SAFETY, INFRASTRUCTURE & OPERATIONS

## MAKING THE RIGHT THINGS HAPPEN



## A VAST AND COMPLEX ENTERPRISE

AGE OF INFRASTRUCTURE



EXCESS FACILITIES



CONDITION OF INFRASTRUCTURE

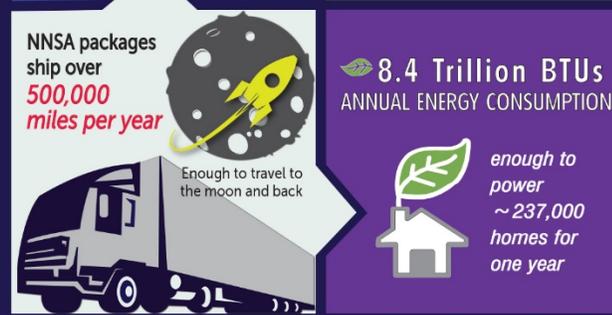
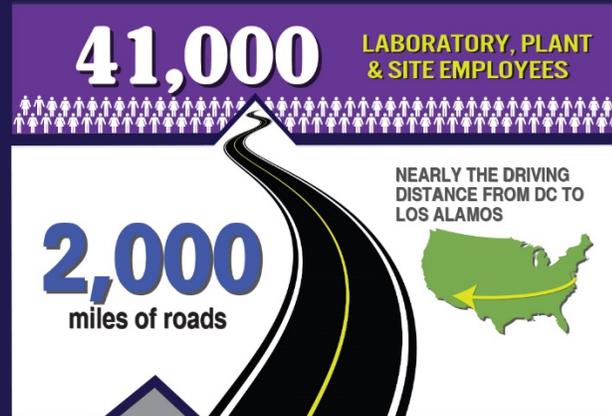


### Vision

We contribute to national security now and in the future by managing the complex NNSA risks of safety, infrastructure, materials, and the environment.

### Mission

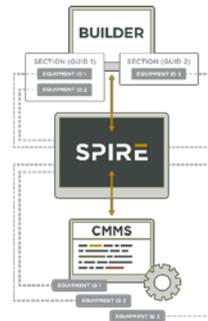
Enable safe operations, ensure effective infrastructure, and provide enterprise services to meet National Nuclear Security Administration needs.



# Infrastructure Tools

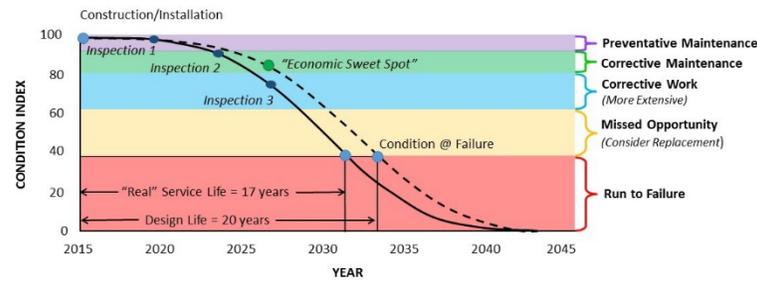
A **science-based infrastructure stewardship** approach using risk-based, data-driven metrics to prioritize investments in order to enable the mission.

## Computerized Maintenance Management Systems



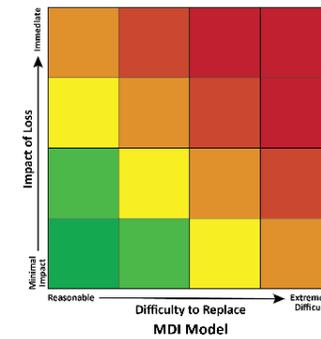
Track daily maintenance activities

## BUILDER™



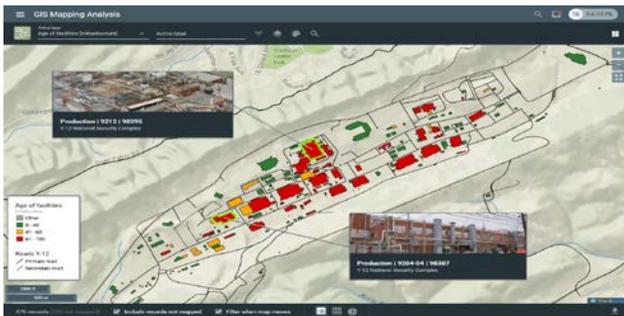
Measures likelihood of losing a facility

## Mission Dependency Index



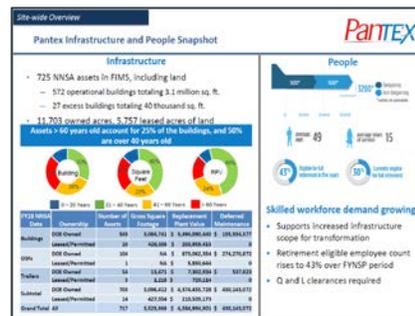
Measures mission impact if a facility is lost

## G2



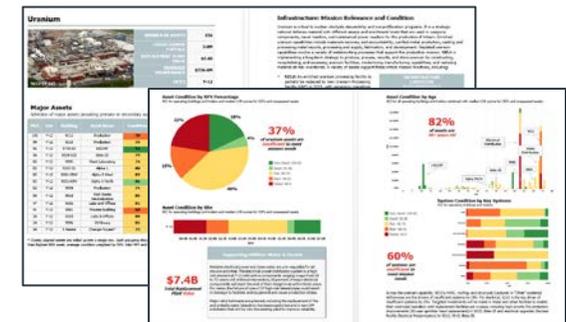
Award-winning program management system

## Deep Dives



In-depth biennial infrastructure review

## Master Asset Plan



Risk-informed strategic planning process

# Infrastructure Tools - BUILDER



BUILDER implementation ensures **standardized data collection**, provides **detailed reporting metrics**, **streamlines communications**, and enhances **agency credibility**.

## Issue

-  Insufficient BUILDER™ catalog
  - Inaccurate or missing replacement/removal costs
  - Inaccurate design lives
  - Vague item descriptions
  - Lacked NNSA-specific inventory items
-  Undervalued Replacement Plant Values (RPV)
  - Out-dated RPV models and unit prices
  - No 1-1 relationship between FIMS Usage Codes and RPV models
  - NNSA unique facilities with no RPV model

## Solution

-  Updated BUILDER™ catalog
  - Initial wholesale update with industry standard replacement/removal costs and design lives
  - New integrated cost modifier capability
  - Monthly updates to reflect NNSA-specific items
  - Annual updates once baseline is set
-  Created Cost Engine to generate accurate RPV
  - Companion software tool that merges model data with actual BUILDER™ inventory
  - Seamlessly communicates with BUILDER™ via SPIRE application (data integration tool between BUILDER™ and other databases or software)

# BUILDER<sup>™</sup> Cost/Catalog Update



# Challenges in Cost Data



## BUILDER™ Catalog/Cost Book

- ~4,000 catalog items with unit replacement cost and design life (DL)
- 999 catalog items with \$0 unit replacement cost info
- 1,640 catalog items with General, Other and Unknown descriptions

## Challenges:

- **Validation** of cost data source
- **Up to date** catalog and cost information
  - Reflects the current cost information
  - Captures the latest facility equipment and agency unique equipment
  - The latest industry standards service/design life
- **Completeness** of NNSA BUILDER™ catalog/cost book

# Detailed Project Scope: Cost/Catalog Update

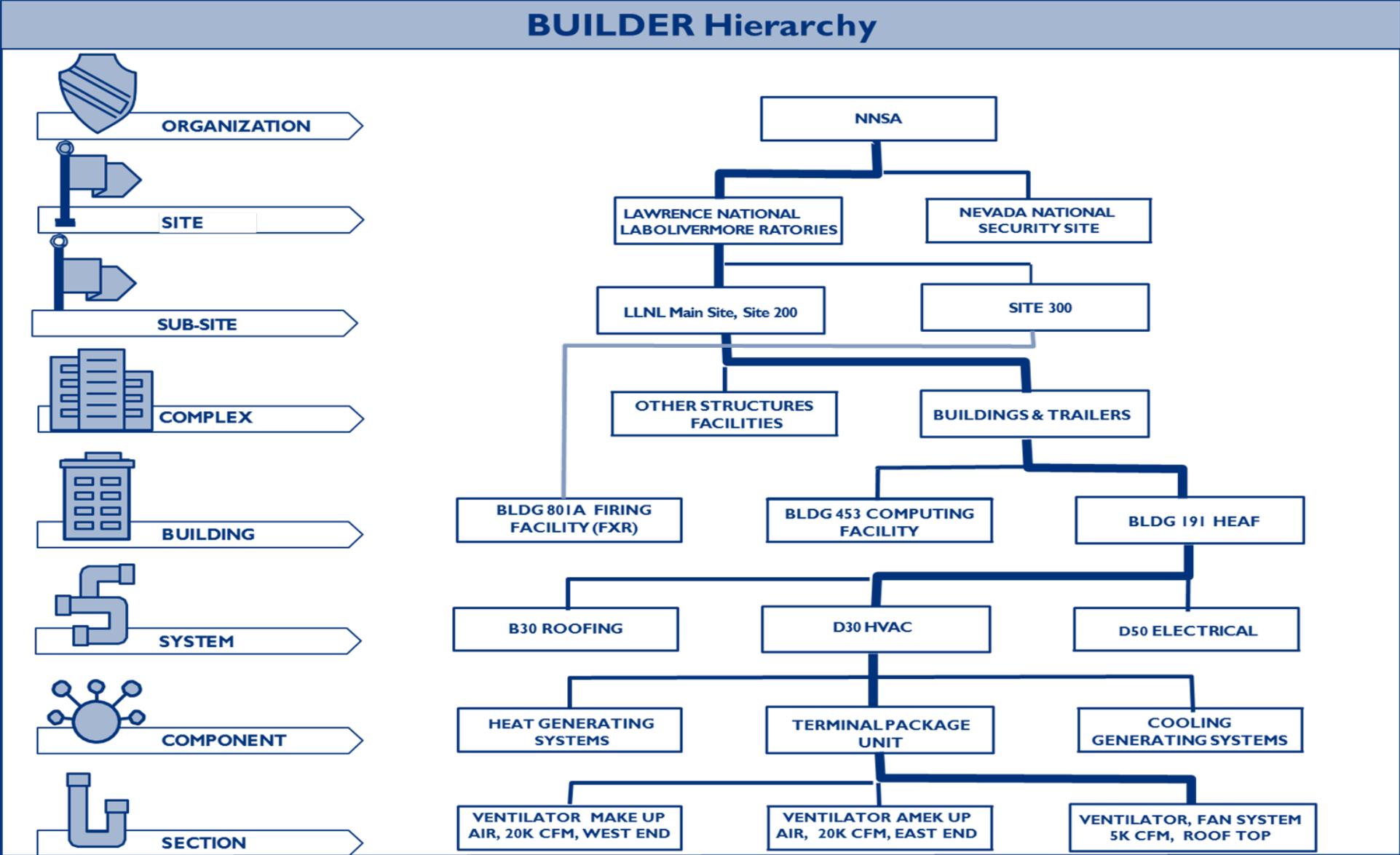
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## Integrate RSMeans data assemblies to ~4,000 BUILDER™ catalog items

- Map at BUILDER™ Level V (Component/Section)
- Use/modify existing assemblies
- Create 225 new, NNSA-specific assemblies
- ~ 2000 new catalog items
- API behind firewall

# BUILDER™ Inventory Data Structure



RSMeans data from **GORDIAN**®



# RSMMeans data Structure

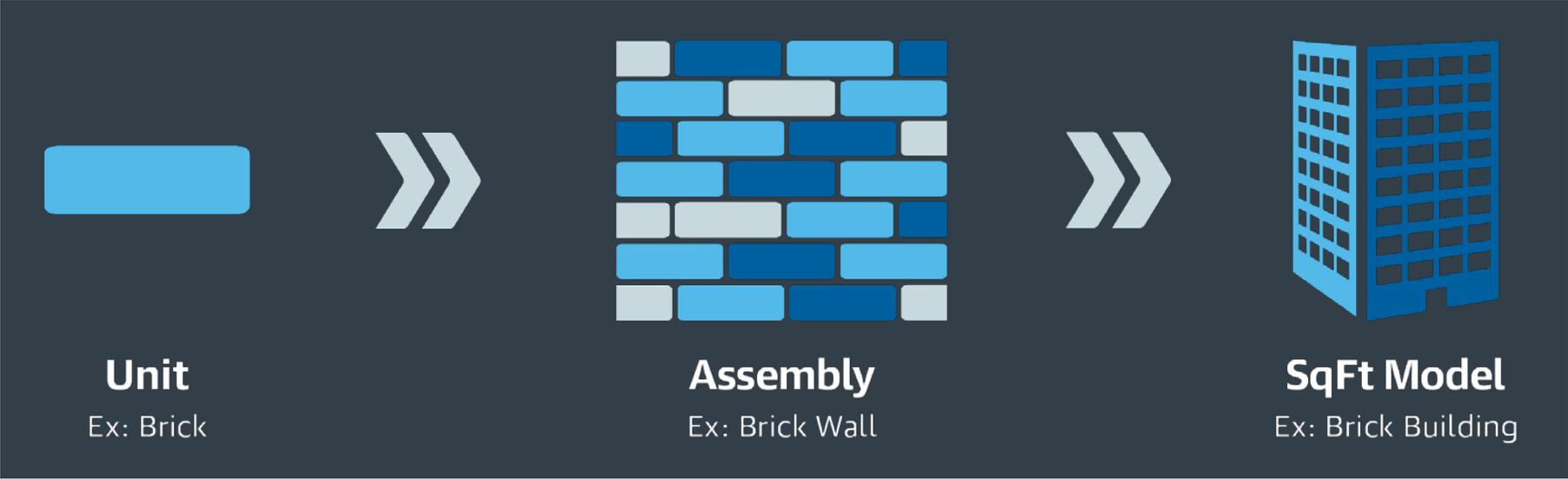
RSMMeans data  
from **GORDIAN**<sup>®</sup>

Database is comprised of:

**85,000+**  
**Units**

**22,000+**  
**Assemblies**

**150+ Square**  
**Foot Models**



# Challenges in Replacement Value

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## NNSA Replacement Plant Value (RPV)

- 80 RPV RSMMeans data models created for Department of Energy
- Unit price driven calculation

## Challenges:

- Out-dated RPV models and unit prices
- Gaps to capture agency unique facilities
- Creates inaccurate RPVs with inaccurate agency RP portfolios
- Assembly type, "Remove and Replace" verses "New Install"

# "Remove and Replace" Assemblies



BUILDER™

- **Remove & replace:** Boiler, electric, steam, 720 KW, 2456 MBH
- Cost: \$89,200



NNSA BUILDER™

- **Replace:** Boiler, electric, steam, 720KW, 2456 MBH
- Cost: \$79,200
- Remove: \$10,000

Separate catalog for removal \$10,000. Used to calculate the "Deferred Maintenance" and "Repair Needs"

# Mapping BUILDER™ to RSMeans data

Current NNSA Catalog							
CMC	System	Component	Mat_Cat	Comp_Type	Design Life	Unit Cost	UoM
21350	A10 FOUNDATIONS	A1010 STANDARD FOUNDATIONS	A101001 WALL FOUNDATIONS	Strip Footing	150	72.47	LF
21351	A10 FOUNDATIONS	A1010 STANDARD FOUNDATIONS	A101001 WALL FOUNDATIONS	Grade Beams	100	163.63	LF
30212	A10 FOUNDATIONS	A1010 STANDARD FOUNDATIONS	A101001 WALL FOUNDATIONS	Foundation Wall	100	8.76	SF



RSMeans data				
RSMeans data ID Number	RSMeans data Description	Design Life	Unit Cost	U of M
A10101053060	Foundation wall, CIP, 6' wall height, direct chute, .222 CY/LF, 10.8 PLF, 12" thick	100	132.00	LF
A10202104600	Grade beam, 30' span, 40" deep, 18" wide, 8 KLF load	100	151.50	LF
A10101051520	Foundation wall, CIP, 4' wall height, direct chute, .1 CY/LF, 4.8 PLF, 8" thick	100	78.50	LF

# Mapping BUILDER™ General, Other and Unknown to RSMeans data

Current NNSA Catalog							
CMC	System	Component	Mat_Cat	Comp_Type	Design Life	Unit Cost	UoM
41000	A10 FOUNDATION	A1010 STANDARD FOUNDATIONS	A101001 WALL FOUNDATIONS	General	100	72	SF
42000	A10 FOUNDATION	A1010 STANDARD FOUNDATIONS	A101001 WALL FOUNDATIONS	Other	100	72	SF
43000	A10 FOUNDATION	A1010 STANDARD FOUNDATIONS	A101001 WALL FOUNDATIONS	Unknown	100	72	SF

# Mapping BUILDER™ General, Other and Unknown to RSMMeans data

Current NNSA Catalog			
CMC	System	Component	Mat_Cat
102049	A10 FOUNDATIONS	A1010 STANDARD FOUNDATIONS	A101001 WALL FOUNDATIONS



RSMMeans data				
RSMMeans data ID Number	RSMMeans data Description	Design Life	Unit Cost	U of M
A10101053060	Foundation wall, average	100	95	LF

# Design Life



Current NNSA Catalog

CMC	System	Component	Mat_Cat	Comp_Type	Design Life	Unit Cost	UoM
21412	B30 ROOFING	B3010 ROOF COVERINGS	B301002 LOW SLOPE ROOF SYSTEMS	Single Ply Membrane	20	5.07	SF
21413	B30 ROOFING	B3010 ROOF COVERINGS	B301002 LOW SLOPE ROOF SYSTEMS	Built-Up	10	6.05	SF
30107	B30 ROOFING	B3010 ROOF COVERINGS	B301002 LOW SLOPE ROOF SYSTEMS	Liquid Elastomers	10	5.46	SF
30119	B30 ROOFING	B3010 ROOF COVERINGS	B301002 LOW SLOPE ROOF SYSTEMS	Modified Bitumen	20	4.8	SF

RSMMeans data

RSMMeans data ID Number	RSMMeans data Description	Design Life	Unit Cost	U of M
B30101203300	Roofing, single ply membrane, EPDM, 60 mils, fully adhered	20	2.44	SF
B30101051600	Roofing, asphalt flood coat, gravel, base sheet, 4 plies 15# asphalt felt, mopped	20	3.74	SF
075610100025	Elastomeric roofing, acrylic, 44% solids, 2 coats, on smooth metal	20	0.89	SF
B30101204000	Roofing, single ply membrane, mb, sbs modified, granule surf cap sheet, mopped, 150 mils	15	3.61	SF

# Parametric Components

D5020019000	DOE - 2 Story Office - Branch Wiring		SF			\$2.29
Unit Cost ID	Description	Qty	Unit	Material	Labor	Total OP
260519900940	Wire, copper, solid, 600 volt, #12, type THWN-THHN, in raceway	0.0040	C.L.F.	\$11.75	\$61.50	\$0.29
260533132500	Intermediate metal conduit, 1/2" diameter, to 10' high, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	0.1850	L.F.	\$2.42	\$6.80	\$1.71
260533160150	Outlet boxes, pressed steel, 4" square	0.0040	Ea.	\$3.17	\$34.00	\$0.15
260533160300	Outlet boxes, pressed steel, plaster rings, 4" square, concealed	0.0040	Ea.	\$2.24	\$10.60	\$0.05
262726202460	Duplex receptacle, grounded, 120 volt, 15 amp	0.0040	Ea.	\$1.39	\$16.95	\$0.07
262726203110	Wall plate, brown plastic, 1 gang	0.0040	Ea.	\$0.42	\$8.50	\$0.04

# Custom Building Models for RPV



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## Leverage RSMeans data cost engine and models to calculate RPV at Building Level in BUILDER™

- Use existing 76 models (standard RSMeans data models and DOE)
- Create 38+ new models
- Inform models with refined data from BUILDER™
  - Un-inventoried assets have a defensible modeled value
  - Inventoried assets have a more accurate and specific value

# Suite of RSMeans data Cost Models



Existing Models		New
38 RSMeans data <i>Standard Models</i>	38 DOE Custom Models <i>Developed in 2002-2004</i>	38+ NNSA Specific* <i>including OSF</i>
Standard Models- Enhanced for DOE Building	<ul style="list-style-type: none"> <li>Steam Plant, Oil Process Bldg w/ Pool</li> <li>Records Storage/Vault</li> <li>Explosives Handling</li> <li>Accelerator-Ring</li> <li>Component Staging Facility</li> <li>High Explosive Subassembly Facility</li> </ul>	<ul style="list-style-type: none"> <li>Lift Station</li> <li>Personnel Gate</li> <li>Guard Tower</li> <li>High-Security Building</li> <li>20' diameter Elevator Shaft</li> </ul>

\*Adding 6+ More

# BUILDER<sup>™</sup> Cost Engine



# Detailed Project Scope: Cost Engine

---

**Goal:** More accurate and defensible costs to inform decision making

**Project:** Integrate more accurate and defensible RPV values at the component and building levels in BUILDER™

**Approach:**

- Map and configure from RSMeans data to BUILDER™ components and buildings
- Enhance the RSMeans data catalog with NNSA-specific items
- Provide Cost Engine to calculate RPV using inventory from BUILDER™ and Cost Modifiers from SPIRE
- Provide Cost Engine RPV report in BUILDER™ Sustainment Management System

# Challenges in Cost Engine Development

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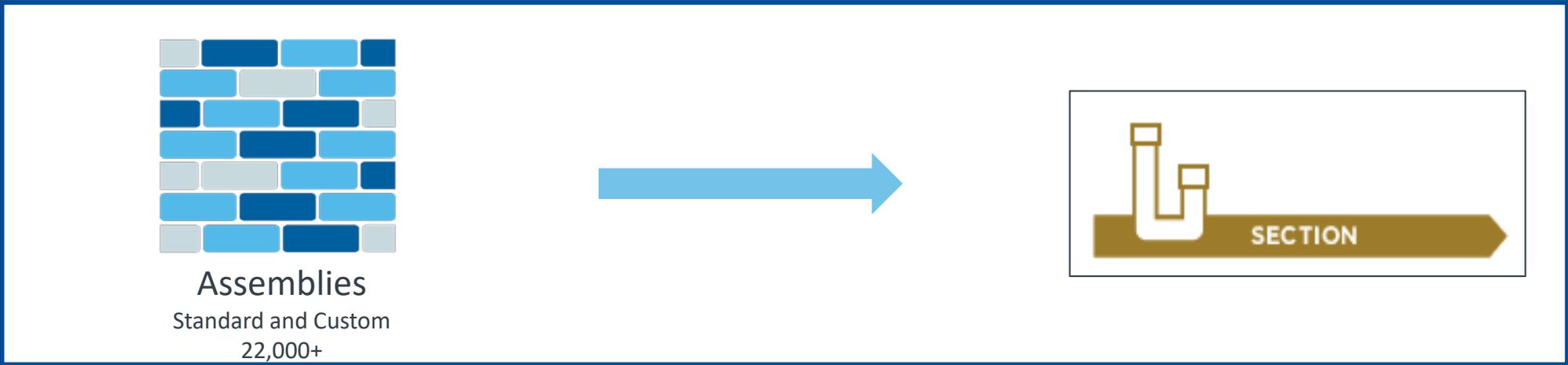
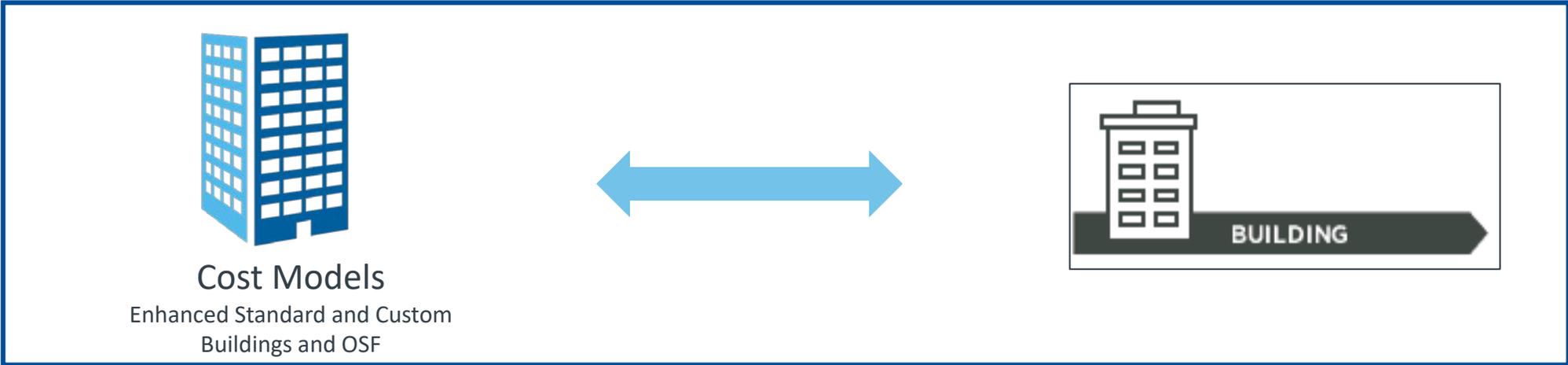
- Integration of Multiple systems developed by different Organizations and with different standards during Development and Production Release
  - DIGON Systems SPIRE
  - BUILDER™
  - RSMeans data API
- Handling custom Cost Modifiers
- Defensibility of Estimated RPVs
  - BUILDER™ Section Inventory (CMC) to Gordian Model Assemblies
- Providing Cost Engine support

# NNSA Solution Overview

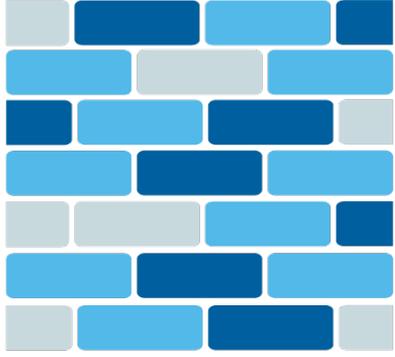


## RSMMeans data

## BUILDER™ Database



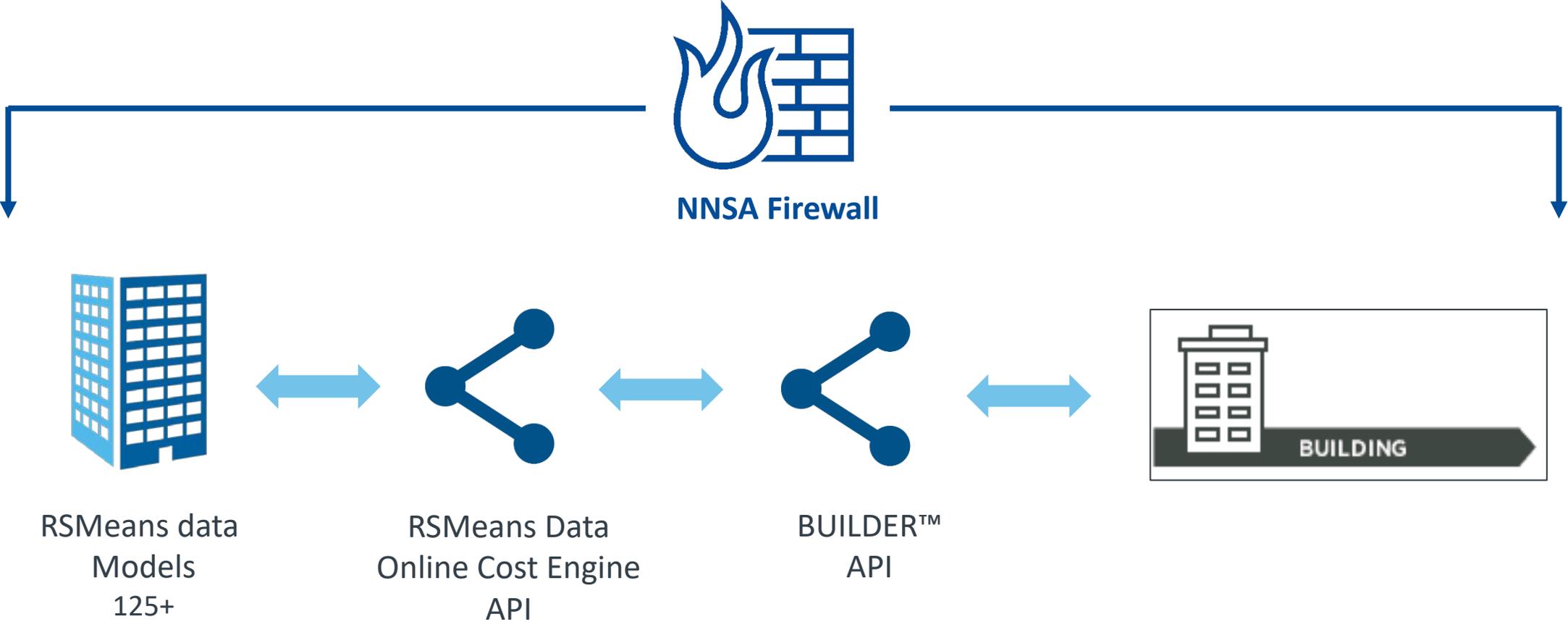
# RSMMeans data Assemblies Mapped to BUILDER™ Component Section



Assemblies  
12,000+

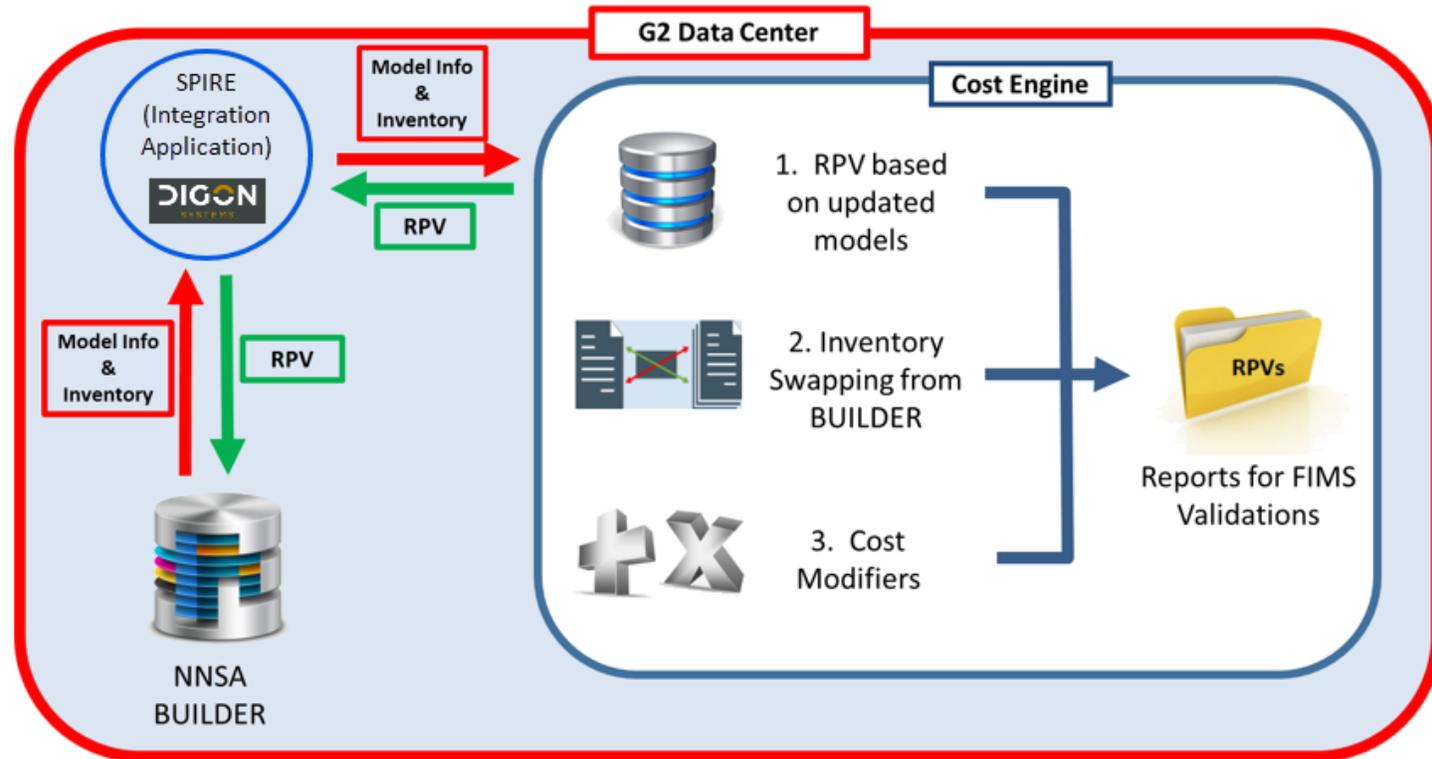


# RSMMeans data Models Informing BUILDER™



# Cost Engine Integration Diagram

1. Cost Engine 'Scheduler' initiates a request to update RPVs for NNSA assets
2. Cost Engine requests asset information from BUILDER™ via SPIRE and Schedules RPV estimation for all Supported asset types
3. Cost Engine receives BUILDER™ inventory via SPIRE
4. Cost Engine generates enhanced RPV and returns to BUILDER™ via SPIRE to populate the new value



# RPV Reports

## Site Level RPV Summary

- Quick view of total RPV costs for the Site

## Building Level RPV Summary

- Building Identifying details
- Base Comparison RPV
- Adjusted/Customized RPV
- Quick Link to RPV Details

## Building RPV Details

- Building Identifying details
- Previous, Base and Adjusted RPV

## Itemized RPV costs

- Item Details
- Adjustment Actions
- Inline Base to Adjusted item costs comparison
- Cost Modifiers

# RPV Summary Report

Report Date: 4/29/2019 8:13:11 AM

Site	Previous Model	Base Model Rpv	Adjusted Model Rpv
Ford Heights, IL	\$463,909.62	\$344,886.13	\$938,721.07

Building No.	Building Name - Builder	RPUID	Category Code	Facility Qty	Model Name - RSMeans	Base Model Rpv	Adjusted Model Rpv
14	EQUIPMENT STORAGE	841	388 - General Facilities Storage	209 SF	Warehouse	\$143,852.13	\$167,514.05
66	SMALL PARTS ASSEMBLY	613	231 - Manufacturing Facilities	711 SF	Factory, 1 Story	\$201,034.00	\$771,207.02

## Building

<b>Site:</b>	Ford Heights, IL	<a href="#">Go Back to Summary</a>
<b>Bldg Name - Builder:</b>	EQUIPMENT STORAGE	<b>RPV Model</b> Warehouse
<b>Building Number:</b>	14	
<b>RPUID</b>	841	<b>RSMO Model #:</b> 2019-069-01
<b>Category Code:</b>	388 - General Facilities Storage	
<b>Facility Qty:</b>	209 SF	<b>Completed</b> 4/27/2019 1:25:39 PM

# RPV Detail Report

### RPV Cost Summary

<b>Previous Model RPV:</b>	\$101,023.06
<b>Base Model RPV:</b>	\$143,852.13
<b>Adjusted Model RPV:</b>	\$167,514.05

### RPV Cost Details

Item	Description	Action Applied	UOM	Area Factor	Base Mult.	Adj Mult.	Base Adder	Adj Adder	Base QTY	Adj QTY	Base Cost Per Unit	Adj Cost Per Unit	Base Total Cost	Adj Total Cost
A10101051520	Foundation wall, CIP, 4' wall height, direct chute, .099	None	L.F.	1.1	1.06	1.06	N/A	\$0.00	1082.9	1082.9	\$95.12	\$95.12	\$103,005.45	\$103,005.45
A10301203440	Slab on grade, 5" thick, heavy industrial, reinforced	None	S.F.	1.1	1.06	1.06	N/A	\$0.00	209	209	\$16.59	\$16.59	\$3,467.31	\$3,467.31
B20302203450	Door, steel 18 gauge, hollow metal, 1 door with frame, no label, 3'-0" x 7'-0" opening	UPDATE	Opng.	1.1	1.06	1.06	N/A	\$50.00	0.0355	3	\$3,381.40	\$3,381.40	\$120.04	\$10,194.20
B30101301050	Roofing, corrugated, steel, colored, 26 ga, 1.43 PSF	None	S.F.	1.1	1.06	1.06	N/A	\$0.00	374.17	374.17	\$5.59	\$5.59	\$2,091.61	\$2,091.61
C10101266250	Metal partition, 5/8" fire rated gypsum board face, 5/8" fire rated gypsum board base, 3-5/8" @ 24"	ADD	S.F.	1.1	0	1.15	N/A	\$0.00	0	139.1795	\$0.00	\$8.31	\$0.00	\$1,156.58
C20101100680	Stairs, steel, grate type w/nosing & rails, 20 risers, with	None	Flight	1.1	1.06	1.06	N/A	\$0.00	2	2	\$17,415.38	\$17,415.38	\$34,830.76	\$34,830.76
D20101101960	Water closet, vitreous china, tank type, 1 piece low	ADD	Ea.	1.1	0	1.12	N/A	\$0.00	0	2	\$0.00	\$2,180.64	\$0.00	\$4,361.28
D20101102000	Water closet, vitreous china, tank type, 2 piece close	REMOVE	Ea.	1.1	1.06	0	N/A	\$0.00	0.0419	0	\$1,818.96	\$0.00	\$76.21	\$0.00
D20102102000	Urinal, vitreous china, wall hung	UPDATE	Ea.	1.1	1.06	1.06	N/A	\$0.00	0.0279	1	\$1,754.83	\$1,754.83	\$48.96	\$1,754.83
D20103102040	Lavatory w/trim, wall hung, PE on CI, 18" x 15"	UPDATE	Ea.	1.1	1.06	1.06	N/A	\$0.00	0.0698	1	\$2,104.63	\$2,104.63	\$146.90	\$2,104.63
D20104404340	Service sink w/trim, PE on CI, wall hung w/rim guard, 24"	UPDATE	Ea.	1.1	1.06	1.04	N/A	\$0.00	0.014	1	\$4,634.85	\$4,547.40	\$64.89	\$4,547.40
Subtotal	Assembly Subtotal	Subtotal	S.F.	N/A	N/A	N/A	N/A	N/A	209	209	\$688.29	\$801.50	\$143,852.13	\$167,514.05
Contractor Fees	Contractor Fees - Percentage of Subtotal	Fee	%	N/A	N/A	N/A	N/A	N/A	0	0	\$0.00	\$0.00	\$0.00	\$0.00
Architectural Fees	Architectural Fees - Percentage of Subtotal	Fee	%	N/A	N/A	N/A	N/A	N/A	0	0	\$0.00	\$0.00	\$0.00	\$0.00
User Fees	User Fees - Percentage of Subtotal	Fee	%	N/A	N/A	N/A	N/A	N/A	0	0	\$0.00	\$0.00	\$0.00	\$0.00
<b>Total</b>	<b>Building RPV Total</b>	<b>Total</b>	<b>S.F.</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>209</b>	<b>209</b>	<b>\$688.29</b>	<b>\$801.50</b>	<b>\$143,852.13</b>	<b>\$167,514.05</b>

# NNSA Cost Engine Project Results



With RSMMeans data...

1. NNSA will be a leader in this important stage of BUILDER™ maturity.
2. NNSA will be the first agency with a high-accuracy BUILDER™ costing system capable of generating customized RPVs.
3. NNSA will have more accurate, defensible costs to support the mission of sustaining aging infrastructure.



# NNSA Builder™ Costing Solution Questions

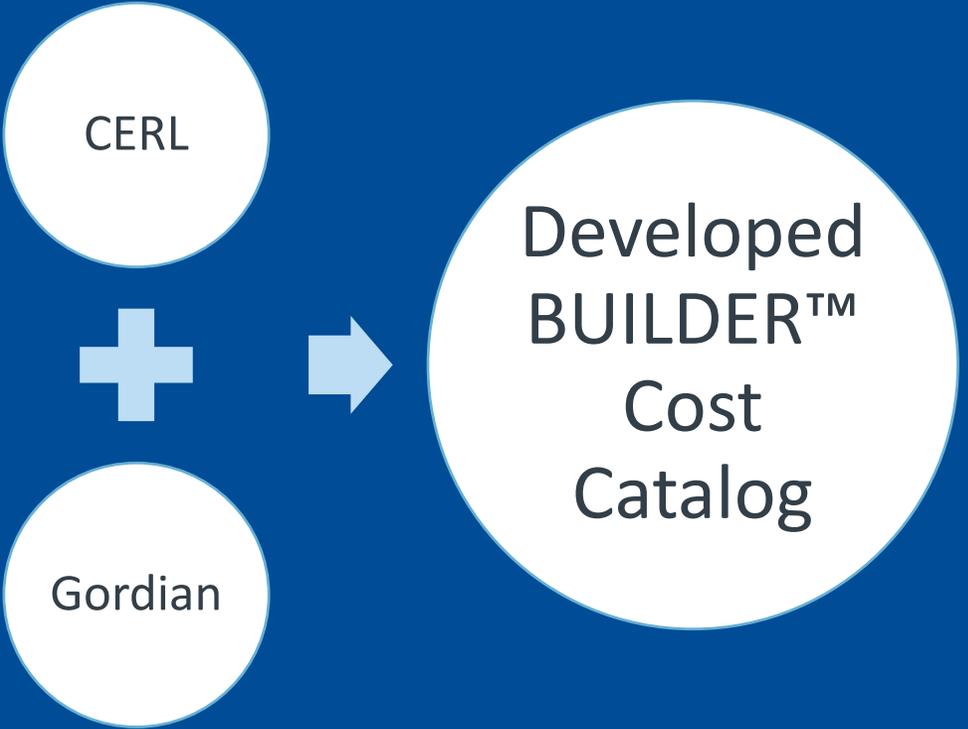
**Julie Krebs**  
NNSA

**Joe Kelble**  
Gordian

**Dale Flamm**  
Gordian

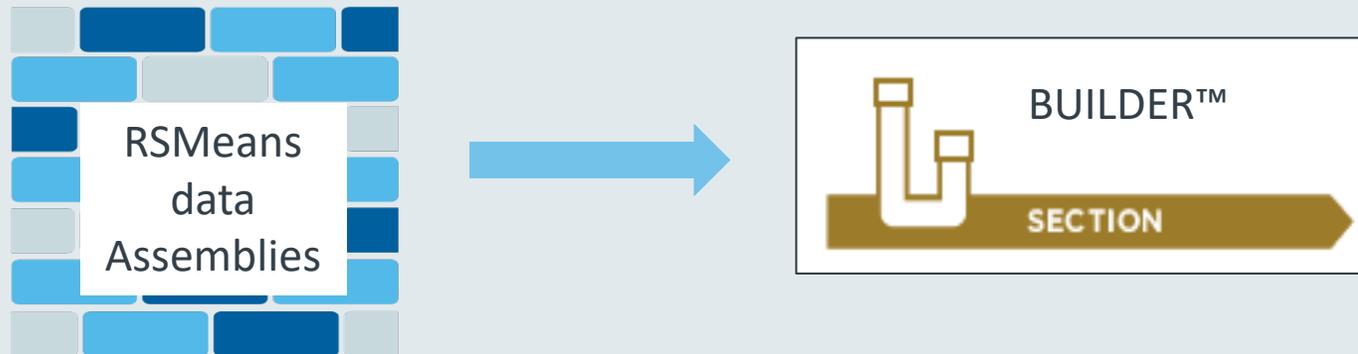


**CRADA**  
COOPERATIVE RESEARCH AND  
DEVELOPMENT AGREEMENT



# Gordian Scope for BUILDER™ Cost Book Development

Gordian will build a mapping and cost data service that resides only within the RSMeans data cost platform that provides ERDC-CERL the ability to request Uniformat Level V cost data, via API, based on the CMCIDs of the BUILDER™ custom catalog.

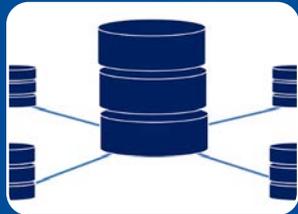


# Gordian's RSMeans data Cost Platform 3 Components



## Mapping

service that stores the associations of the RSMeans data Assembly IDs to BUILDER™ CMCIDs.



## Database

that stores the RSMeans data estimating catalog and all pertinent cost data.

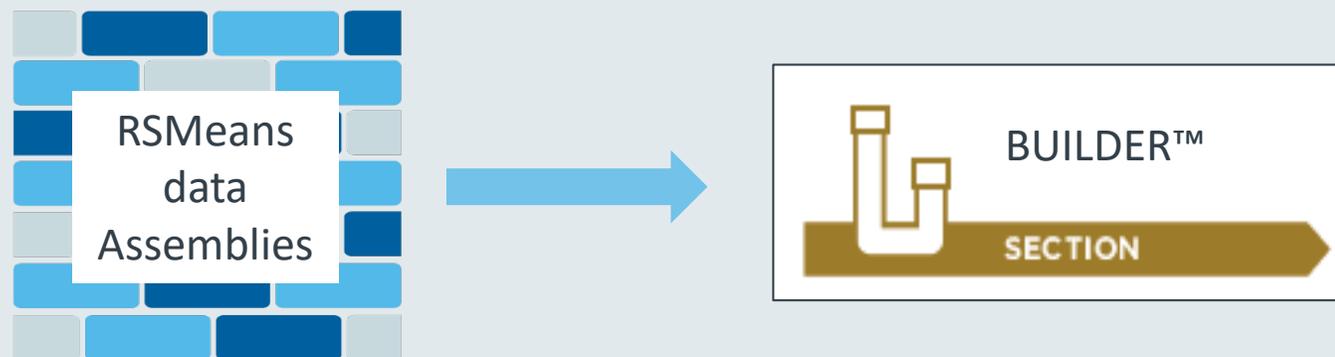


## API

service that is exposed to BUILDER™ that provides the cost data, mapped to BUILDER™ CMCIDs.

# Approximately 3,400 Assemblies mapped

- “Remove and Replace” assemblies
  - The cost includes selective demolition of the item, and installation of a new item.
  - Currently working on integration of Service Life. Available in a flat file.
- There are assemblies for elements A, B, C, D, E, F, G of UNIFORMAT II
  - Element H (Waterfront Structures) is not included.



# BUILDER™ RSMMeans data Cost Book

The screenshot displays the SUSTAINMENT MANAGEMENT SYSTEMS WITH BUILDER interface. The top navigation bar includes 'Work Configuration', 'Work Plan', 'Scenarios', 'Reports', and 'Tools'. A status message indicates the system is approved for UNCLASSIFIED//FOUO data. The main window is divided into a left sidebar and a main content area. The sidebar shows a tree view under 'Inventory' with 'Gordian Test Org' selected. The main content area has tabs for 'General Info.', 'Contact Info.', and 'Assessment History'. The 'General Info.' tab is active, showing fields for 'Number' and 'Name' (Gordian Test Org). Below these are sections for 'Index Data' (a table) and 'Reference Settings' (a list of dropdown menus). A 'Calculated Data' section shows 'PRV: (\$1)'.

**Index Data**

Metric	Value
CI	-
FI	-
PI	-
FCI	< 0

**Reference Settings**

- Cost Book: RSMMeans Builder Catalog
- Inflation Book: Reference
- Service Life Book: RSMMeans Service Life Book
- Policy Sequence: FY-2015 Sequence
- Prioritization Scheme: POM-2015 Priority
- CII Set: Reference
- FCI Goal: Select a FCI Goal
- Cost Modifier Library: Walters Test

# BUILDER™ RSMMeans data Cost Book

Cost Book:  Inflation Set:  Cost Source:   
 Minimum Cost:  Minimum Paint Cost:  Setup Cost:

Level:   
 Activity:  System:

Unit Costs should reflect basic costs prior to Location-Specific (Area Cost Factor) factors being applied. However, if this is a custom cost book, inflation is included in cost calculations.

	Reset	Component	Material or Equipment Type	Component Type	Current Cost	Units
	<a href="#">Reset</a>	B3010 ROOF COVERINGS	B301001 STEEP SLOPE ROOF SYSTEMS	Asbestos Cement Shingles	\$3.54	SF
	<a href="#">Reset</a>	B3010 ROOF COVERINGS	B301001 STEEP SLOPE ROOF SYSTEMS	Asphalt Shingles	\$3.25	SF
	<a href="#">Reset</a>	B3010 ROOF COVERINGS	B301001 STEEP SLOPE ROOF SYSTEMS	Clay Tile	\$10.69	SF
	<a href="#">Reset</a>	B3010 ROOF COVERINGS	B301001 STEEP SLOPE ROOF SYSTEMS	Concrete Shingles	\$12.11	SF
	<a href="#">Reset</a>	B3010 ROOF COVERINGS	B301001 STEEP SLOPE ROOF SYSTEMS	Concrete Tile	\$4.13	SF
	<a href="#">Reset</a>	B3010 ROOF COVERINGS	B301001 STEEP SLOPE ROOF SYSTEMS	Fiberglass Shingles	\$9.14	SF
	<a href="#">Reset</a>	B3010 ROOF COVERINGS	B301001 STEEP SLOPE ROOF SYSTEMS	Formed Metal	\$15.05	SF
	<a href="#">Reset</a>	B3010 ROOF COVERINGS	B301001 STEEP SLOPE ROOF SYSTEMS	Formed Metal - Metal Standing Seam	\$7.46	SF
	<a href="#">Reset</a>	B3010 ROOF COVERINGS	B301001 STEEP SLOPE ROOF SYSTEMS	General	\$5.90	SF
	<a href="#">Reset</a>	B3010 ROOF COVERINGS	B301001 STEEP SLOPE ROOF SYSTEMS	Metal Shingles	\$3.34	SF

# BUILDER™ RSMMeans data Cost Book

Cost Book:  Inflation Set:  Cost Source:   
 Minimum Cost:  Minimum Paint Cost:  Setup Cost:

Level:  Activity:  System:

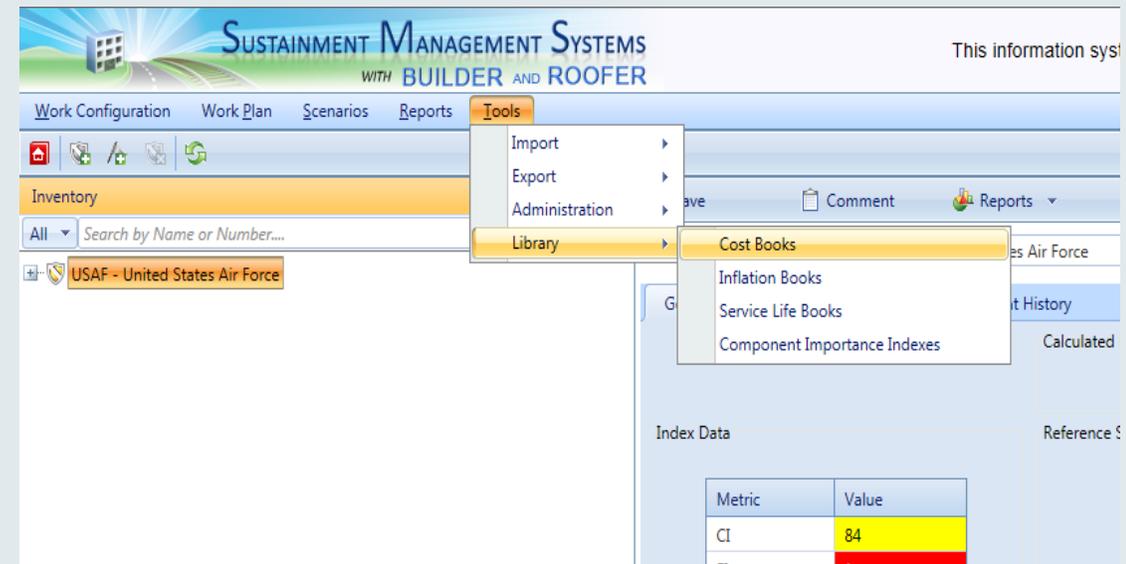
Unit Costs  General Multipliers  Specific Multipliers

Unit Costs should reflect basic costs prior to Location-Specific (Area Cost Factor) factors being applied. However, if this is a custom cost book, inflation is included in cost calculations.

	Reset	Component	Material or Equipment Type	Component Type	Current Cost	Units
		<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<a href="#">Reset</a>	D3010 ENERGY SUPPLY	D301002 GAS SUPPLY SYSTEM	Fuel Storage Tank	\$7,083.95	EA
	<a href="#">Reset</a>	D3010 ENERGY SUPPLY	D301002 GAS SUPPLY SYSTEM	Fuel Storage Tank - Fuel Storage Tank, 1000 GAL	\$4,132.31	EA
	<a href="#">Reset</a>	D3010 ENERGY SUPPLY	D301002 GAS SUPPLY SYSTEM	Fuel Storage Tank - Fuel Storage Tank, 2500 GAL	\$7,083.95	EA
	<a href="#">Reset</a>	D3010 ENERGY SUPPLY	D301002 GAS SUPPLY SYSTEM	Fuel Storage Tank - Fuel Storage Tank, 5000 GAL	\$16,450.00	EA
	<a href="#">Reset</a>	D3010 ENERGY SUPPLY	D301002 GAS SUPPLY SYSTEM	Gas Meter	\$477.00	EA
	<a href="#">Reset</a>	D3010 ENERGY SUPPLY	D301002 GAS SUPPLY SYSTEM	General	\$23.61	MBH
	<a href="#">Reset</a>	D3010 ENERGY SUPPLY	D301002 GAS SUPPLY SYSTEM	Other	\$1.18	MBH
	<a href="#">Reset</a>	D3010 ENERGY SUPPLY	D301002 GAS SUPPLY SYSTEM	Unknown	\$1.16	MBH

# Access to RSMeans data Cost Book for BUILDER™

- Contact Gordian (Tony, Mike, Lisa) or CERL
- Purchase Data License from Gordian
- Agency provides Gordian Technician with access to their instance of BUILDER™
- Gordian Technician adds the RSMeans data Cost Book to BUILDER™
- Updates provided annually



# RSMMeans data BUILDER™ Cost Book Contacts

---

**Joe Kelble**  
**Data**

**Dale Flamm**  
**Cost Engine**

**Todd Glowac**  
**API**

**Lisa Cooley**  
**VP Federal Solutions**

**Mike Bartoli**  
**CRADA/Business**

**Tony Edwards**  
**CRADA/Business**

Thank You!



# *BUILDER Development Roadmap*

- Bug Fixes – Various Lines of Effort
- Silverlight Removal
- Functionality Base Question Updates
- Quarterly Releases

# *Bug Fixes*

- Defects with 3.5.2 capabilities being addressed by a new federal developer
- Significant bug-fix effort over the next year

# *Silverlight Removal*

## **Completed Work Thus Far**

- Scenarios  
Management

## **Planned for Near- Term Completion**

- Functionality  
Assessments
- Functionality  
Configuration
- Scenarios  
Management (3.5  
features)

# *Functionality Question Updates*

- New 'off-the-shelf' Functionality Assessment Set (default Functionality option)
- New Assessments based on the Whole Building Design Guide

# *Quarterly Releases*

- Progress has been made in release cycle; setting a date w/ features and meeting it
- Room for improvement on hitting release dates
- Working to increase federal staff for accepting contracted development work, coordinating testing results and scheduling customer upgrades
- Nearing ability for automated deployments (updates in the middle of the night as opposed to scheduled downtime)



# 2020 February Summit

Summit @ San Antonio Riverwalk – (<https://www.defensecommunities.org/>)  
February 12-14, 2020

Please send feedback and future discussions to:  
[kurt@digonsystems.com](mailto:kurt@digonsystems.com)





# Conference Alignment

## Association of Defense Communities

<https://www.defensecommunities.org>



<https://installationinnovation.org>

- February 10-12
- Hyatt Regency San Antonio Riverwalk

The future of innovation is our destination at ADC's Installation Innovation Forum 2020 in San Antonio, Texas. More than 700 leaders from 100+ installations, 200 communities and states and top industry experts will gather for three days focused on defining the future of innovation and sharing what works today. From infrastructure support and base operations to resiliency and quality of life, IIF 2020 will provide an in-depth look at the great ideas that are ready to work in your community and installation.



# Training

Wednesday, February 12

Track 1: Assessor Boot Camp Direct Rating Calibration

Track 2: Program Management Sustainment Strategies





# Thursday Agenda: 08:00 – 16:00

## Morning Topics

- 3.6 Feature Preview & Timing
- Enterprise SMS Update
- Optimizing BUILDER Data to Your Audience
- UNIFORMAT Scope Inclusion

## Afternoon Workshop Topics

- System Admin / BUILDER Hosting
- Functionality Assessment Workshop
- Metrics Deep Dive (BCI vs FCI)
- Quantify Risk (MDI & CII)



# Friday Agenda: 08:00 – 14:30

---

## Morning Topics

- Cost / Design Life Catalog
- Field Assessment Innovations
- Custom Reports
- CMMS Integration (Closing the loop)

## Afternoon Workshop Topics

- BUILDER Analytics Story Telling
- Scenarios + FCI “POM” planning



BREAK

# LUNCH

Resume @ 01:00PM

Keck 100

# Breakout Session Format

- We learned! – Pre-appointed leads for each session!
- Incorporating topics from February Summit Survey.
- Workshop style, dig in, ask questions, take notes, and make suggestions for future sessions!
- Attempting to record each session to make it available for later viewing.

# Breakout Session #2

## Locations:

"A" – Keck 100

"B" – Keck E St.  
Conf Rm.

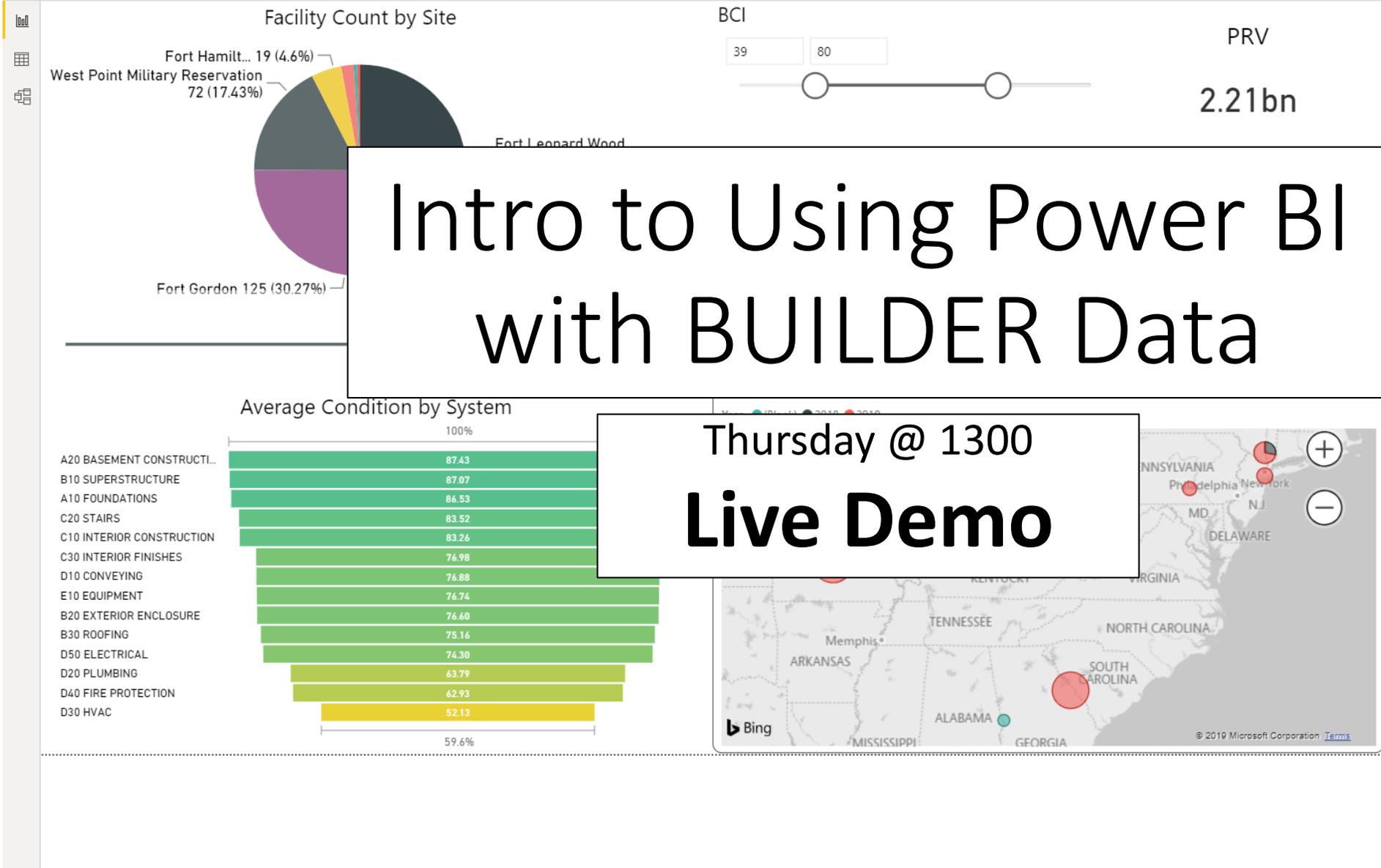
"C" – Keck 206

Online – Refer to  
Agenda

Session 2A: 1:00 PM—2:30 PM Intro to Using  
PowerBI with BUILDER Data

Session 2B: 1:00 PM—2:30 PM EquipMapper  
Data Migration Utility

Session 2C: 1:00 PM—2:30 PM Dams Working  
Committee



# Intro to Using Power BI with BUILDER Data

Thursday @ 1300  
**Live Demo**

**Visualizations**

**Fields**

Search

- Final 02 - System Su...
- Final 03 - Compone...
- Final 09 - Building S...

**Filters**

Values

Add data fields here

**Drillthrough**

Cross-report

Off

Keep all filters

On

Add drillthrough fields here

# We are going to cover...

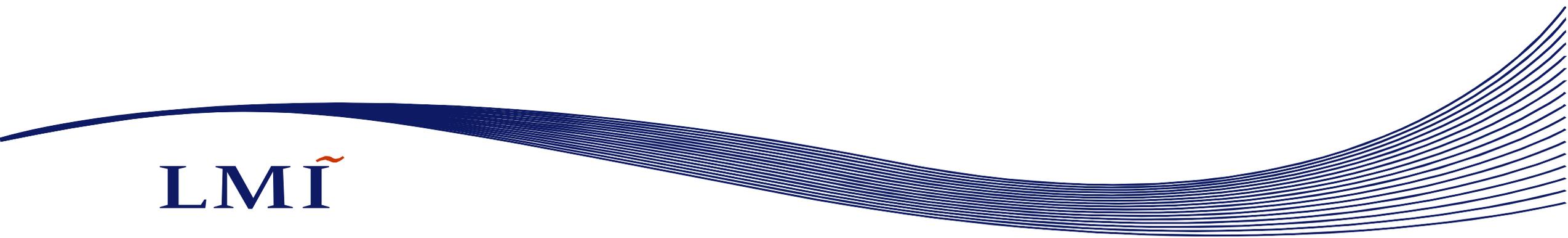
- Retrieving data from BUILDER using Custom Reports
- Power BI website
- Downloading Power BI
- Power BI Data Sources
- Data Preparation, Query Editing
- Data Modeling
- Adding Pie Charts, Cards, Funnel, etc..
- Visual Formatting
- Adding Filters
- Advanced Visual Filtering
- Adding Map Visual
- Conditional Formatting
- Editing Interactions
- Tooltips
- Drill through
- Adding Shapes
- Other?

# WMA BUILDER Summit 2019

## EquipMapper

8/15/2019

LMI

A decorative graphic at the bottom of the slide consisting of a series of dark blue wavy lines that flow from left to right, starting with a single thick line on the left and transitioning into many thin lines on the right.

# EquipMapper

---

- EquipMapper
  - EquipMapper v5.3 10-18-2018.accdb
- Requirements
- Demo
  - Bulk Data Loading
  - Inspection Loading

# EquipMapper

---

- MS Access driven data loading utility developed by CERL
- Creates BUILDER data records by associating user data with existing catalog assets
- Creates data records in a BUILDER exported BRED file through a user configured map
  - Add new Sections that include asset records
  - Add updated information to existing asset records
  - Add inspection data for existing assets

# Requirements

---

- MS Access installed
- BRED file

# BRED File

---

- Exported from BUILDER
- Includes target buildings
- Must have RPUID in Alternate\_ID field
  - Pre-BUILDER 3.5 requires manual addition of RPUID
    - BRED Application
    - MS Access entry in Facility Table
- Inspector must have a BUILDER account with role for target building level before export

# Requirements

---

- MS Access installed
- BRED file
- Lookup.mdb

# Lookup.mdb

---

- Source for BUILDER catalog data
- Must match the target BUILDER instance and be in a data location accessible to the user
  - Boilerplate version generated during BRED installation
  - Updated version generated through CERL utility
  - Target UF II Level 5 must be in the Catalog

# Requirements

---

- MS Access installed
- BRED file
- Lookup.mdb
- Source Data

# Source Data

---

- Minimum data requirements are the same as for adding a section plus
  - Unique Facility Identifier
    - Alternate\_ID field in the BRED file
    - FacilityRPUID field in input template
- Recommend source data include UF II through Level 5 that match the target BUILDER Catalog
- Sectioning strategy

# Requirements

---

- MS Access installed
- BRED file
- Lookup.mdb
- Source Data
- Input Template

# Input Template

---

- Blank Excel template generated from first screen in the EquipMapper application
  - Can be updated to latest version of excel
  - The single worksheet must be named “FlatFile”
- Self generated templates must be an exact match in terms of field names
- Save all input templates

# Template Fields

---

## – FacilityRPUID

- Used to align the building(s) in the BRED file with the asset data for those buildings in the input template

## – Level 1 through Level 5

- Source data values that will be mapped to UFII values contained in the IC BUILDER catalog
- Recommend source data use the same UFII codes and data as the BUILDER Catalog
- Use single quote (‘) to include leading zero
- No carriage returns in Level 5 text

# Template Fields

---

## – UniquelIdentifier

- Unique value for each asset in each section.
- Aligns new inspection data with existing assets
- Visible as “ID Number” for equipment items in Section Details in BUILDER

## – Capacity

- BUILDER does not store quantity in Section Details
- Recommend mirroring Quantity values

# Template Fields

---

## – Location

- One of three fields used to combine multiple assets into single sections
- Useful field for Section Name, area location, etc.

## – Equipment\_Type

- Information field
- Visible in Section Details without scrolling
- Useful for Section Name
- Use to help identify assets in a multi-asset section

# Template Fields

---

- Install Year
  - YYYY format – straight number
- EstimatedDate
  - TRUE or FALSE
  - Never leave blank
- Quantity
  - Relative to the assets UOM
  - Not stored in BUILDER
  - Recommend duplicating in Capacity field

# Template Fields

---

## – UOM

- Must be able to map to one of the existing IC BUILDER UOM values

## – Comments

- Last field visible in Section Details (scroll far right)
- Useful to summarize assets in a multi-asset section
- Must be “text” format in the input file

# Template Fields

---

## – ConditionRating

- Must be able to map to one of IC BUILDER direct ratings.
- For multi-asset sections EM will average CI values

## – ConditionDate

- mm/dd/yyyy format
- EM will take earliest date for multi-asset sections when common source/inspector

# Template Fields

---

- **ConditionComments**
  - Optional
  - Useful to describe any differences between asset in a multi-asset section
- **ConditionSource**
  - Impacts combining inspections in multi-asset sections

# Template Fields

---

## – BUILDER\_UserName

- Mandatory for inspections
- Must be a registered user with permissions at the location of the inspection before BRED file is exported
- Exact username (login) required
- Will show up in assessment list as last name, first name of the registered user

# Inspections

---

- Load initial inspection with initial data
- Load subsequent inspections if assets are already in the BRED file
  - All assets must have a unique identifier value

# Combining Inspection Data

---

- When Source and Inspector are Common
  - Uses Unique identifier to match individual assets
  - Converts direct inspection rating to numeric value
  - Determines mathematical average value across all assets in the section
  - Converts the average back to a direct inspection rating
  - Uses the earliest inspection date of all assets in a section

# Combining Inspection Data

---

- When Source and Inspector are different
  - Creates separate inspections when one or both are different
  - Randomly orders inspections if dates are identical
  - Takes CI of one inspection
  - Bottom Line – Ensure ConditionSource and BUILDER\_UserName are consistent across all assets in same section

# Sectioning

---

- **Three Attributes**
  - By Location, Install Date (Vintage), and floor
  - Recommend always use Vintage
  - Use Location field for data to force sectioning
  - Floor field must be a numeral
- **Section Details = input template line for line**
- **Naming**
  - EM does not assign section names
  - Recommend putting desired section name in Equipment\_Type field

# User Tips

---

- Put quantity and UOM in Comments
- Put unique ID in Eq.Type Field for non-equipment
- EM doesn't like carriage returns in Level 5 field
- EM turns numlock off
- Use "Close" buttons when available
- Use ' to include leading zeros in UFII level codes
- EM will not reconcile UOM

# EquipMapper Demo

---

- Input File
- EquipMapper
  - Load initial data plus initial inspection
  - Load future inspection

# What's Next?

---

- Template generator that includes data from BRED file

# Breakout Session #3

## Locations:

"A" – Keck 100

"B" – Keck E St.  
Conf Rm.

"C" – Keck 206

Online – Refer to  
Agenda

Session 3A: 2:30 PM—4:00 PM BUILDER  
Assessment Quality Assurance

Session 3B: 2:30 PM—4:00 PM Systems  
Integration - BUILDER API Workshop

Session 3C: 2:30 PM—4:00 PM IC Discussion



*2019 DC Summit*  
**ARNG BUILDER**  
**QA / QC**

*Joseph Allison*  
*NGB Builder SME*

[joseph.l.allison4.ctr@mail.mil](mailto:joseph.l.allison4.ctr@mail.mil)

*(703)601-6740*

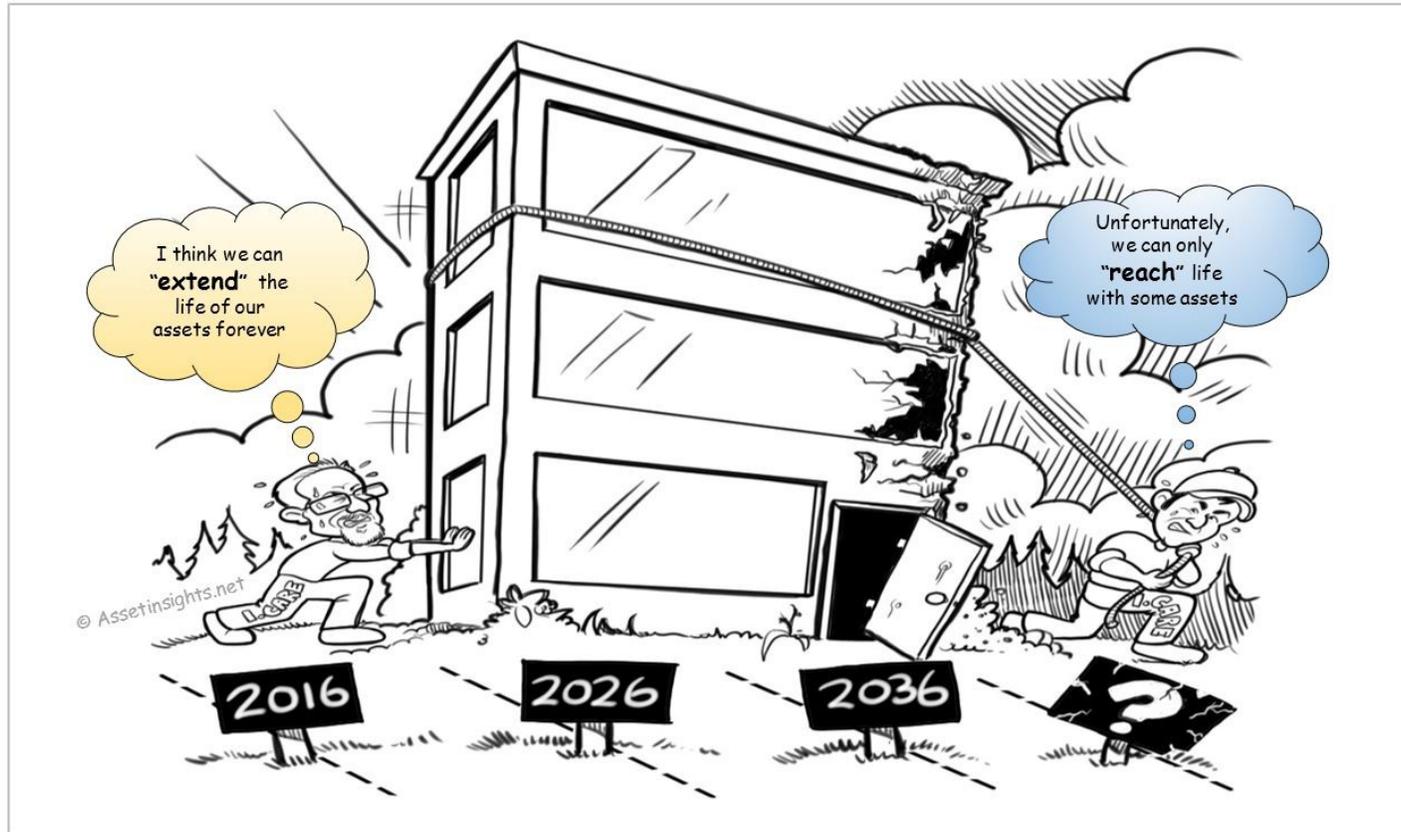


# Format

- Ask a question when you have it
- Discussion is encouraged
- Feel free to share your experience



# Life Cycle Challenge

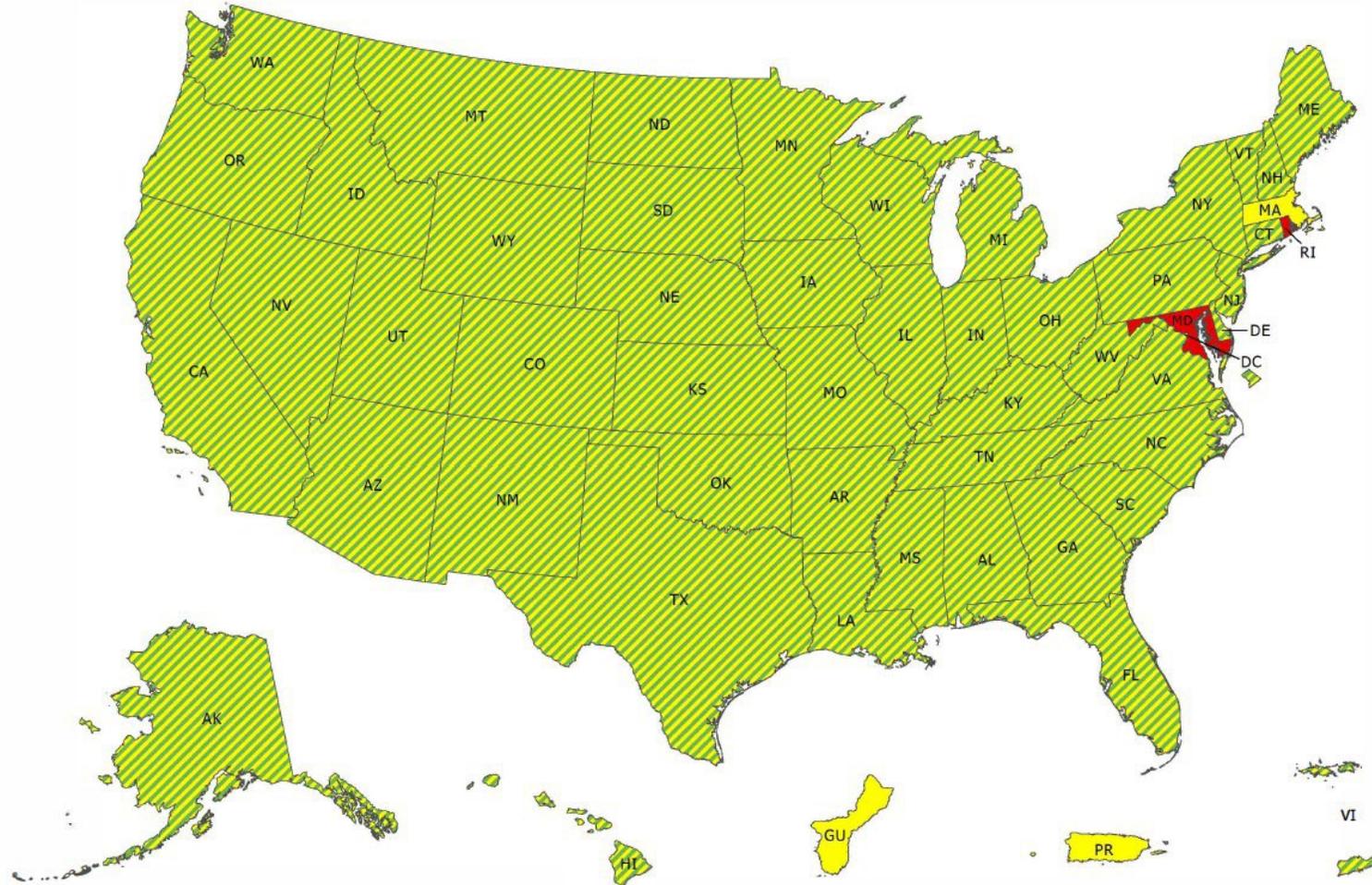




# ARNG BUILDER Status Report

Generated From BUILDER SMS on 1 July 2019

ARNG-IES



### Inspection Status

- FCI Validated
- FCA In Progress
- Activity Indicated
- No Activity Indicated

*BUILDER Facility Condition Index ready for ISR topbad*

*BUILDER Facility Condition Assessment in progress/complete*

*BUILDER contract in process but no data reported*

*No BUILDER Contracts Active or Awarded*



ARNG BUILDER Status as of 1 July 2019

S/T ARNG	Progress by SF			Progress by PRV (Some PRVs are missing ?)			Progress by Site			Progress by Building		
	FCA	Total	%	FCA	Total	%	FCA	Total	%	FCA	Total	%
Totals:	65,891,729	163,636,245	40.27%	\$ 22,249,698,277	\$ 45,990,330,136	48.4%	777	2,401	32.4%	7,663	20,357	37.6%

All S/T ARNG have awarded BUILDER contracts except for Maryland, and Rhode Island. Massachusetts and Puerto Rico recently awarded contracts. Both expect to begin FCA's in the near future. Maryland is finalizing a contract with the ACOE. Rhode Island is determining funding for this FY to begin its contracting process.

Guam is reporting a planned delay to fund their BUILDER FCAs 100% to optimize travel costs.

Virgin Islands is reporting that the balance of their BUILDER FCAs will be delayed until the entire remaining balance can be completed to optimize travel costs.

Month to Month Progress			
Row Labels	SF	PTD June	
Alabama	2,015	3,985,512	0.1%
Alaska	97,534	1,046,206	9.3%
Arkansas	233,604	1,950,397	12.0%
California	11,353	2,573,272	0.4%
Colorado	92,207	496,055	18.6%
Indiana	1,310,058	2,280,439	57.4%
Kentucky	102,500	1,789,257	5.7%
Mississippi	1,062,745	3,265,261	32.5%
New Hampshire	34,665	207,828	16.7%
Oklahoma	83,118	589,691	14.1%
Pennsylvania	420,860	859,887	48.9%
Utah	2,716	1,373,007	0.2%
Grand Total:	3,453,376	15,385,095	22.4%



# QA QC Quarterly Report

Q3FY19 QA QC Report 15 July 2019

BUILDER QC Progress by SF			BUILDER Data DQL Level			
Uploaded	Reviewed	%	OFE	Findings	Deficiencies	DQL %
65,891,729	14,935,872	22.7%	93,525	5,098	420	94.55%

QA QC Report Key	
OFE:	Opportunities for Errors
Findings:	Data in need of validation or potential errors
Deficiencies:	Confirmed and Corrected Findings
DQL:	Data Quality Level= (OFE-Findings)/OFE)

	ARNG Foot Print per I&E Corporate Numbers and Map FINAL: 163,500,000 Building SF				
	Assume QC Analysis Hours = 0.00019 HRS/SF				
	1,920 Hours per Person				
	FY18	FY19	FY20	FY21	
Annual SF	40,875,000	40,875,000	40,875,000	40,875,000	NOTE: This makes an unrealistic assumption that 100% of labor is exclusively devoted to providing QA/QC analysis of BUILDER data.
QC Analysis	7,766	7,766	7,766	7,766	
Persons needed:	4.0	4.0	4.0	4.0	
With Auto QA	1.9	1.9	1.9	1.9	



# Healthy Data 1



IT STARTS WITH HEALTHY DATA  
*ARNG Data Repository*

Good Data Rolls Up. This effort provides the opportunity to improve the accuracy of ARNG facilities data! Accurate RPI data is a critical starting point!



# Healthy Data 2

NOT ALL DATA ERRORS ARE CREATED EQUAL!

Data errors that impact BUILDER metrics are critical.

**“Data Informed Decision Making”**

Flawed data YIELDS Flawed Decisions

## Critical Data Elements:

- Dates – Building Construction and Component-Section Install Dates
- Quantities – Building GSF versus Component-Section SF, Basic Accuracy
- Unifomat Category/Section – Correct component category, omissions, and section naming for locating in the future
- UoM – LF, SF, EA, KVA
- Accurate DCR – Mitigate risk to occupants or building mission
- Critical Omissions – i.e. HVAC sources with inadequate/missing distribution or vice versa
- Building Level Commenting – Validate blank systems of the required 14 systems



# Accurate RPI data 1

HQDA EXORD 159-17 ISO ARMY SUSTAINMENT MANAGEMENT  
SYSTEM (SMS) IMPLEMENTATION AND TRAINING

Originator: DA WASHINGTON DC

DTG: 011812Z May 17 Precedence: P DAC: General

3.C.2.B. (U/FOUO) ERRORS FOUND DURING  
SMS INSPECTIONS REGARDING THE REAL  
PROPERTY UNIQUE IDENTIFIER (RPUID) AND  
OTHER REAL PROPERTY ERRORS WILL BE  
CORRECTED IN THE REAL PROPERTY  
INVENTORY.



## Accurate RPI data 2

### NGB GUIDANCE SOW:

5.11.4 *Real Property Discrepancy List* – The A-E shall develop a Real Property Discrepancy List outlining any discrepancies between the provided real property data and physically validated facility data (building square footage, number of stories, etc.). Include buildings that are demolished, funded/scheduled to be demolished, funded for major renovation, or undergoing major renovation. Additionally, the S/T ARNG should ensure that any assets that don't meet the criteria in the EXORD for rating by BUILDER are identified and removed from BUILDER. Otherwise the A-E may perform a BUILDER FCA on assets that violate Federal Funding Guidelines or are unnecessary.



# Accurate RPI data 3



RPI Data Element	Discrepancy	Recent Total	Assessed
PRV	"0"	69	1
GSF	Unable to Quantify	Resolving Site by Site	
Floors	"Blank"	394	40
RPUID	"Missing"	211	34



# Critical Data Elements

- Dates – Building Construction and Component-Section Install Dates
- Quantities – Building GSF versus Component-Section SF, Basic Accuracy
- Uniformat Category/Section – Correct category, omissions, and section naming for locating in the future
- UoM – LF, SF, EA, KVA
- Accurate DCR – Mitigate risk to occupants or building mission
- Critical Omissions – i.e. HVAC sources with inadequate/missing distribution or vice versa
- Building Level Commenting – Validate blank systems of the required 14 systems



# Dates – Building Construction and Component-Section Install Dates

- Obvious – Rarely should Section dates be older than the building
  - Exceptions:
    - ❖ Possible for Equipment Manufactured dates to predate the building
    - ❖ Repurposed equipment
- Do dates match the renovation history in the building level comments?



# Quantities:

- Building GSF versus Component-Section SF – Do quantities for slabs, decks, and roofs make sense when compared to the GSF of the building?
- Basic Accuracy – Do they make sense for the building type, size and floor count?



# Uniformat Category/Sectioning

- Correct component category?
- Is it in scope?
- Are all expected categories for that component present?
- Is the Section Name adequate for locating that component-section in the future?



# UoM – LF, SF, EA, KVA

- Self Explanatory
- Do the quantities and UoM match?



# Accurate DCR 1

- Green (-): Does it adequately mitigate risk to occupants or building mission?
- Amber (+) and below: Is the inspection commenting complete? Distress and %? Inspection photo?
- Does the rating matching the severity of the distress?



# Accurate DCR 2

**Green (-): Does it adequately mitigate risk to building occupants or mission?**

The 2019 version of the Army BUILDER Guide addresses the issue of Component Sections approaching end of life where a visual inspection may not be sufficient to accurately rate it to mitigate risk. In those instances where a strict visual inspection would result in a G minus (88), the assessor is given the option to be informed by its age and rate is as amber or amber (+). i.e. Transformers, Breaker Panels, Hot Water Heaters, Boilers, etc. Here's the actual language.

Service life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.



# Accurate DCR 3

**The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.**

This provides the Facilities Management team the awareness that they have inventory that may need either:

1. Replaced or repaired
2. Warrants a more thorough analysis by those with the expertise and inspection/testing tools to confirm the inventory is performing better than expected
3. Poses nominal risk to run to fail.
4. Or an update to the Catalog Design Life for that Component-Section



# Critical Omissions

- Critical Omissions – i.e. HVAC sources with inadequate/missing distribution or vice versa



# Building Level Commenting 1

From 3.10.1 of NGB/ARNG FY19 BUILDER Guidance Draft SOW:

Building Level Comments shall be populated for each building with the following information:

- 1) Missing systems
- 2) Renovation dates
- 3) Areas of the building not accessible during the assessment
- 4) Systems possibly present but are missing due to partial occupancy
- 5) If drawings were provided. (Does this really have value?)

**CERL plans to delete these blank systems so that reports show “NA” for systems that are not present as validated by this commenting.**



# Building Level Commenting 2

## Business Rules for Building Level Comments

From 3.10.1 of NGB/ARNG FY19 BUILDER Guidance Draft SOW:

1. Business Rules for Building Level Comments:
  1. Missing Systems – Comment when any of the required 14 systems were not present
  2. Renovation Dates – Comment when renovations are reported or discovered (A-E identified obvious additions/renovations after original construction and confirmed with S/T ARNG personnel).
  3. Areas of the building not accessible – Comment when certain areas were not accessible
  4. Systems not in the space occupied by the S/T ARNG – Comment if any of the required 14 systems are omitted when S/T ARNG only occupies a portion of the building.
  5. Drawings were or were not provided – Comment when drawings were provided or not provided depending on whether or not the majority of buildings had drawings provided. i.e. If most buildings have drawings then comment when not provided. If most buildings do NOT have drawings then comment when provided.





# **BUILDER SMS QUALITY CONTROL**

Prepared by: Duane Hodgens

HDR

5555 Tech Center Drive, Suite 310  
Colorado Springs, CO 80919



## Introduction

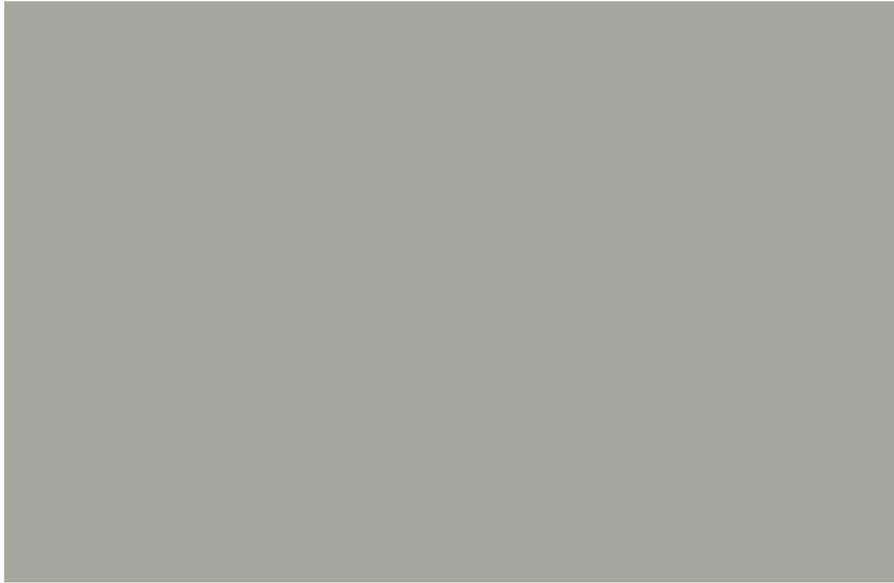
- Duane Hodgens, PE, LEED AP BD+C  
– HDR Quality Control Manager



## Goal

- Quality from a 'Bottom up' view
- Pre-Field Work
- Field Work
- Post-Field Work

*Quality In All Things.*



## Quality Control – Launch/Pre-Field Work

- Important driver of final deliverable quality level.
  - Study the Manual/GFI
  - Learn the Software
  - Standardized Assessment Approach
- Tools... Tools...and more tools
  - Tablets, Cameras, Laser measurers, Software, etc.
- Assessors able to collect data that meets the following goals:
  - Accurate per manual/guides/SOW.
  - Auditable
  - Reliable
  - Repeatable

## Quality Control – Approach

- Team size
- Walk Rate
- Set Zero-Tolerance Rules for Assessors
  - Data entry in field.
  - Link photos in field.
  - Populate Section Details in field
  - Perform assessment in field

## **Pre Field Work – Audience Input!**

- Coordinate with installation on getting as many drawings as possible
- Identify secure areas. It is best to avoid these on the first/last trips.

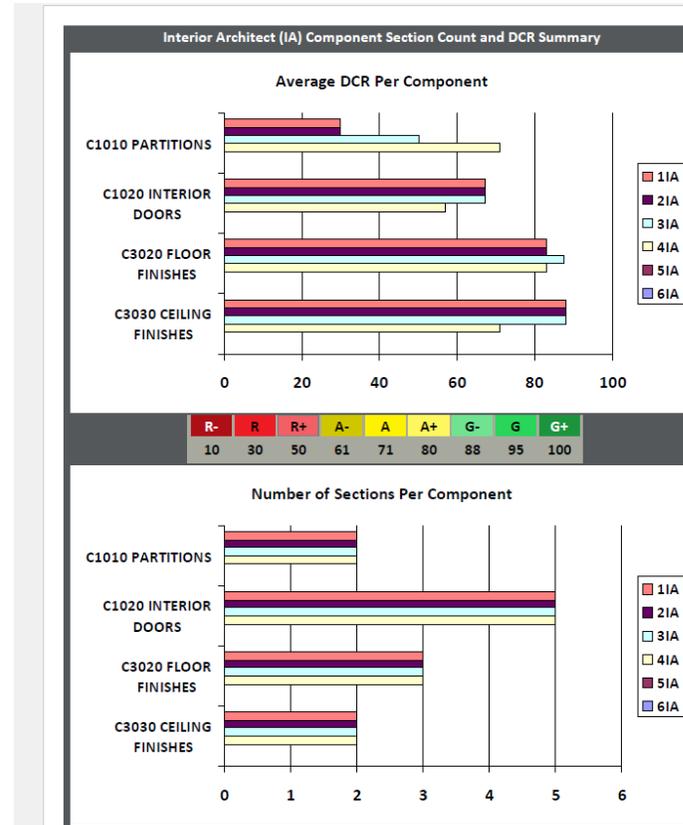


## Quality Control – Field Work

- Field QC Representative
  - Should be checking assessor data. If FQC falls into a ‘training’ role you have failed in the preparation for the field work.
    - Tag-Along FQC
    - Independent FQC
- Don’t ask assessors to do something you can’t do
- Daily feedback to assessors.
- Daily checks of data by off-site personnel. Tuesday data reviewed on Wednesday.
  - Photos
  - Comments

## Cross check report

1. Enables ready comparison of assessment teams' performance at the building, component, and section level.
2. Anomalies are easy to identify and can be probed to illuminate (and eliminate) errors in the execution of the assessment task.

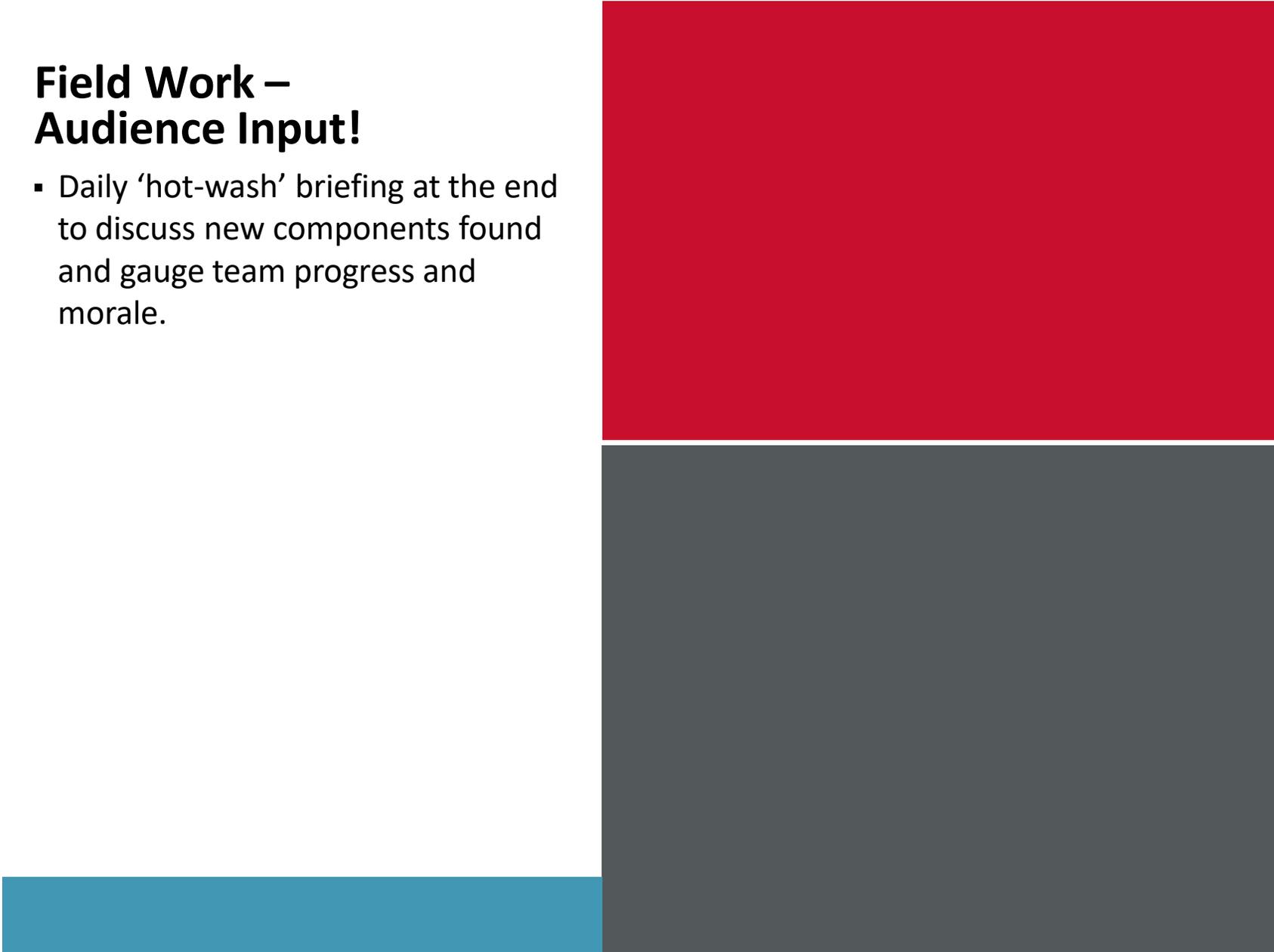


## Field Work - Mottos

- Quality Degrades with Time
  - Data entered at the building is at 100%
  - Data entered that night is at 90%
  - Data entered 2 weeks later is at 25%
- Execute the manual...Not the schedule
  - Quality never takes a back seat to pace
- First Trip/Last Trip Trap
  - Rushing out of the gate or rushing to the finish line results in mistakes.
- Data should look organized in the BRED tree. Unorganized data is hard to follow by follow on users of the data set.

## **Field Work – Audience Input!**

- Daily ‘hot-wash’ briefing at the end to discuss new components found and gauge team progress and morale.



## Quality – Post Trip

- Assessor Self-QC
  - Quantities, Dates, Section Names, Inspection Comments
- Data Quality/Completeness
  - Missing Photos
  - Missing Comments/Spelling
  - Missing Section Details
  - Quantity/Install Date
  - Section Names
    - Accurate and coordinated amongst all assessors
  - Capitalization of Section Name/Details
- Quality Control Manager Review
  - Final check that QC Process was followed and is completed

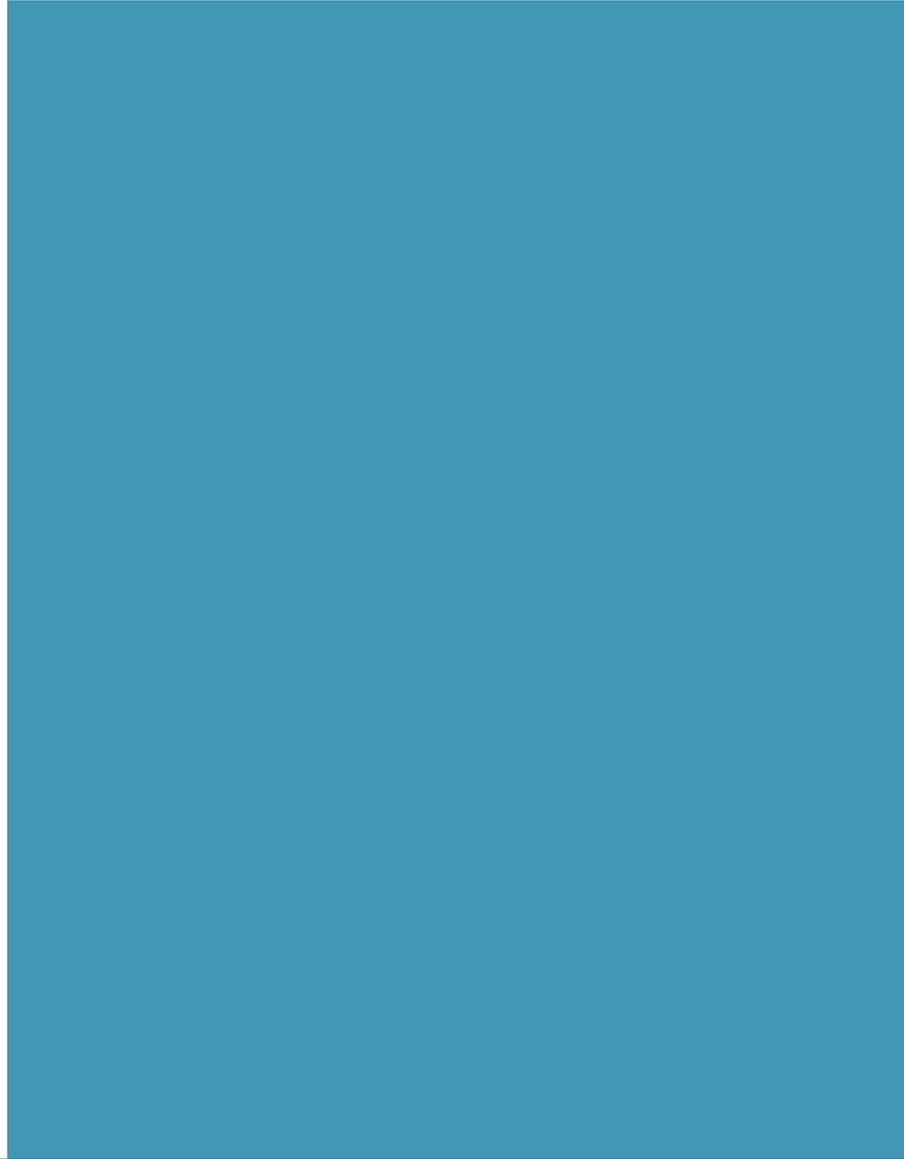
## Quality Control – BRED Rollup

- Quality Control Fixes. Time = \$
  - Data fixes while in assessor BRED files - \$
  - Data fixes after import to BUILDER - \$\$\$\$
- Don't rush to import BRED files if the data is not ready for submission to the government QA
- After BRED import, check Final 9, photos (A+ and below), and building summary.
  - Missing systems can indicate a failed import
  - Missing photos can indicate a failed package file import

## Post Field Work – Audience Input!

- Final QC checks and formatting can be efficiently done on a single BRED file that has an entire trip data set.
  - It was noted that sometimes you may have BRED import issues if this path is chosen.
- QC the QC5i and Final 9 before submission. If photos, comments, details, etc. are missing the data is not ready for submission.

**Questions**





Welcome to the



August 14-15<sup>TH</sup>, 2019 | Keck Center – Washington DC

**REMOTE ATTENDEES**

“B” Sessions: Keck - E Street Conference Room

WebEx: <https://usace.webex.com/join/michael.n.grussing>

Security Code: 0814#





# System Integration Workshop

## BUILDER API Workshop

Presented by Kurt Sorensen, DIGON Systems

### REMOTE ATTENDEES

“B” Sessions: Keck - E Street Conference Room

WebEx: <https://usace.webex.com/join/michael.n.grussing>

Security Code: 0814#





# Introductions / Experience

- Kurt Sorensen

President, DIGON Systems

BUILDER CRADA /  
Distribution Partner

- USDA-ARS
  - ✓ DudeSolutions Import File
- Archibus
  - ✓ Database Integration Support
- NNSA
  - ✓ Maximo, AssetSuite, Gov Applications API Integration
  - ✓ RS Means
- Air National Guard
  - ✓ iEMS API Integration



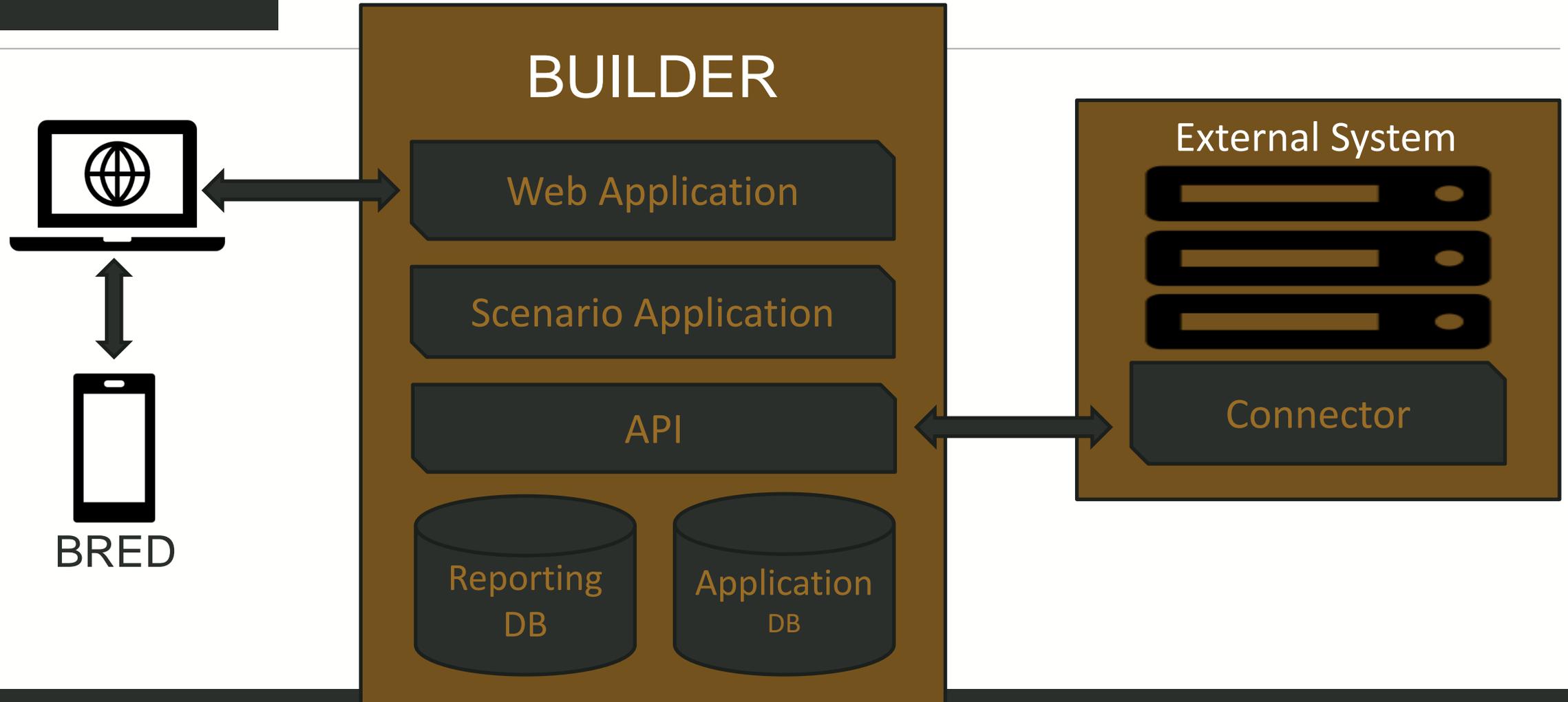
# Breakout Session Goals

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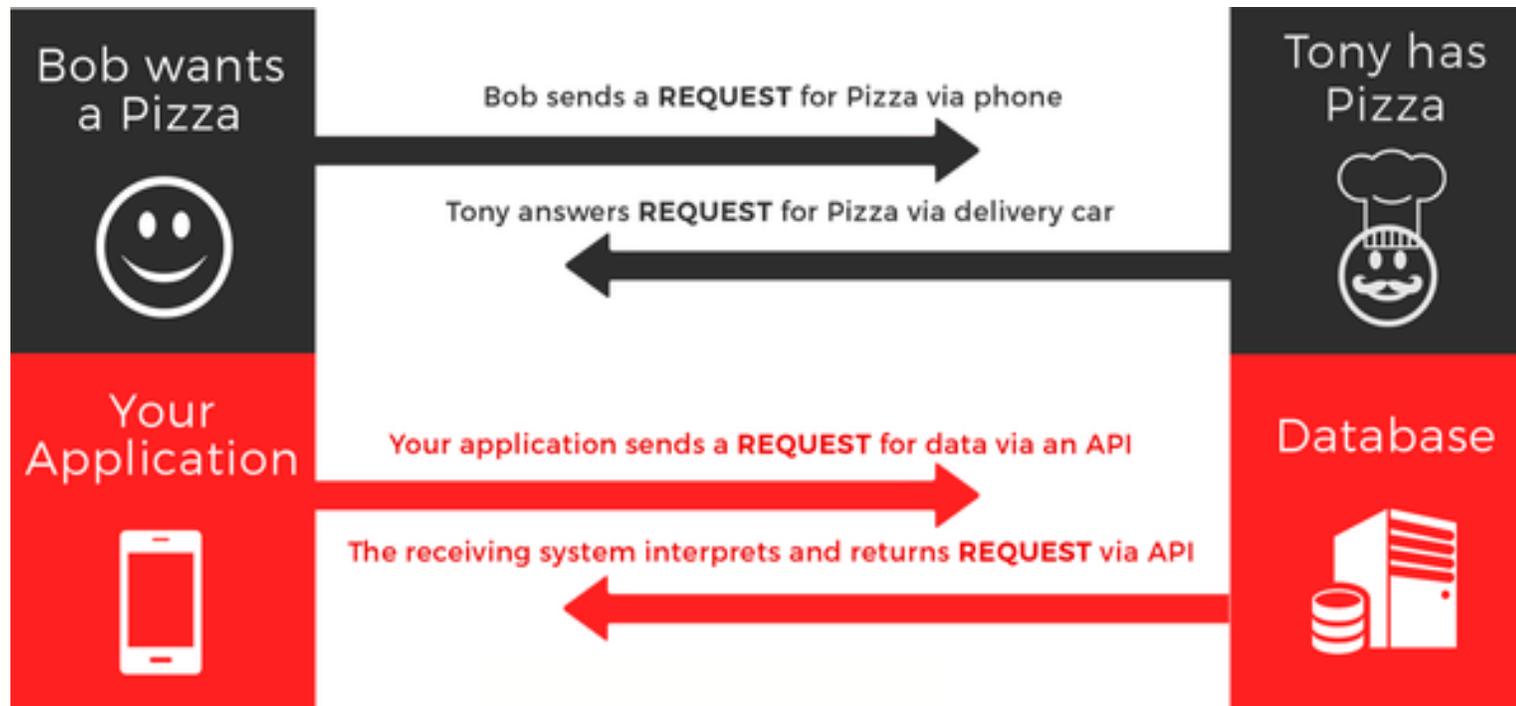
- Introduce Application Programming Interface (API)
- Outline BUILDER API Capabilities / Limitations
- Discuss Application Technology Trends
- API Tool Exercise
- Lessons Learned / Q&A



# BUILDER System View



# API Introduction



- System that enables communications between computer systems
- DIGON built a middle-tier BUILDER API called SPIRE



# Existing Documentation

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- CERL has documentation that is targeted to a software developer audience
- DIGON has documented the commonly used API data elements for our SPIRE integration tool



# Current Capabilities

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- Buildings
- Inventory (Systems, Components, Sections)
- Inspections
- Work Items\*
- Scenarios
- User Management



# Limitations

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## Excluded Capabilities

- Reports
- BRED Tools
- Work Configuration
- Functionality Assessments

## New Features

- Catalog Management
- Photos



# Inventory - Known Issues

- The API will not accept any catalog changes while the BUILDER web interface will allow a L4/5 update  
Example: 5hp pump to a 10hp pump
- Remember that you must create any missing Systems and Components before adding sections to that area of UNIFORMAT



# Inspection - Known Issues

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- The API requires a CI number and not a direct rating color
- Recent bug deletes inspections if viewed in the interface (planned hotfix)
- API can update past inspections without the date limit enforced through the UI



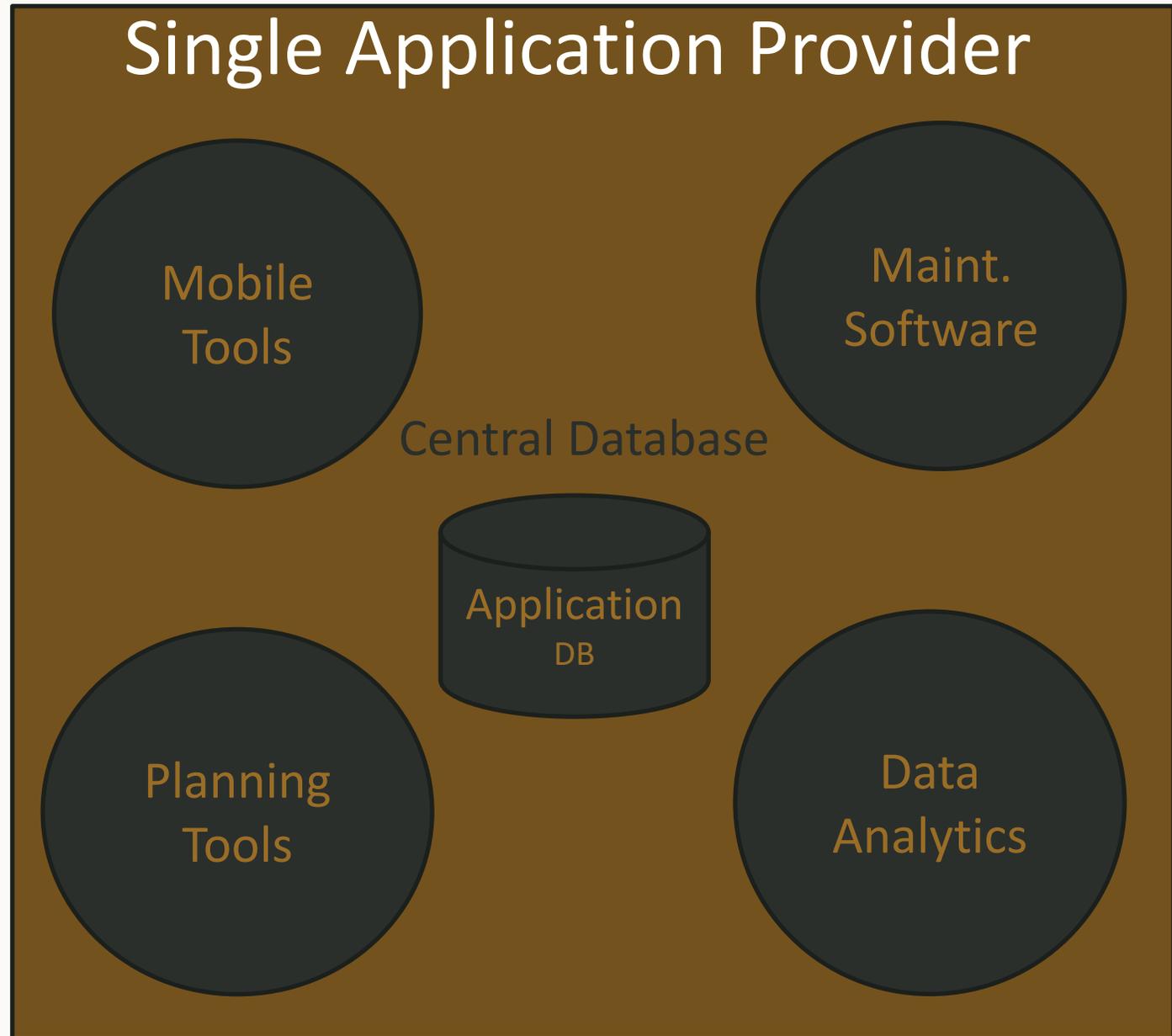
# Work Management - Known Issues

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- Cannot generate work plan items through the API
- Setting a work item status to complete does not yet perform all the required inventory updates

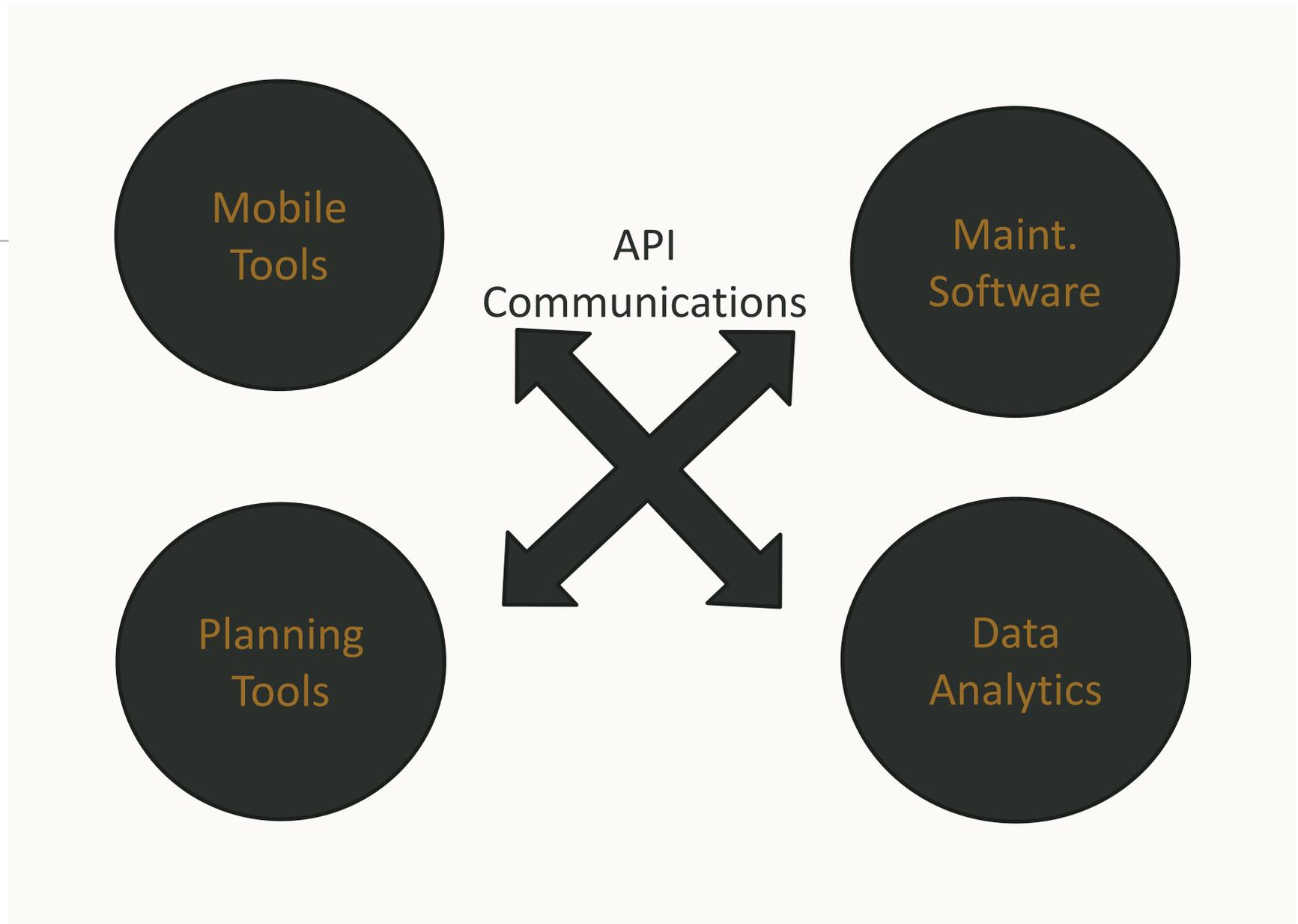


# Past Application Structure





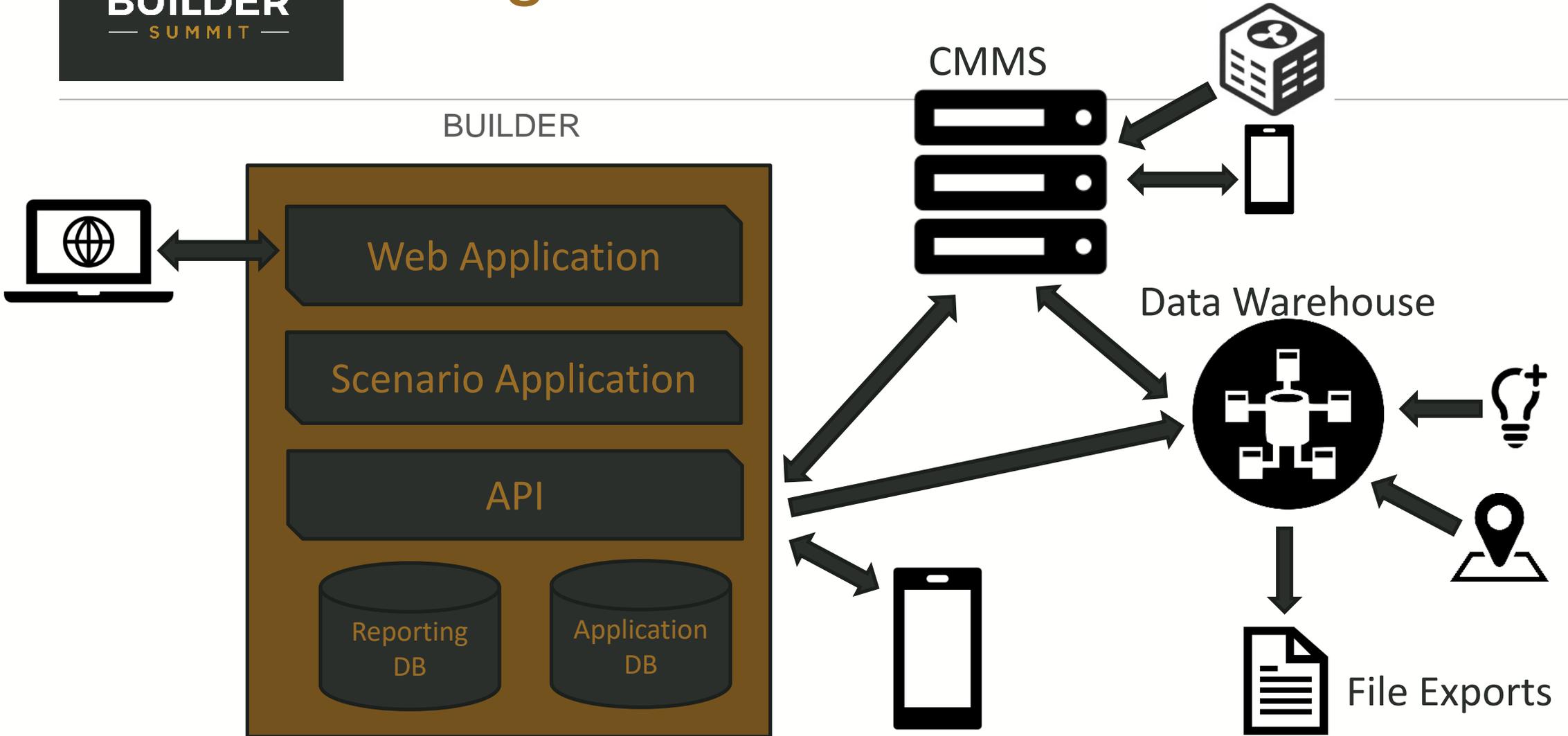
# Specialized and Open Applications





# Imagine Possibilities

BUILDER





# eSMS BUILDER Development

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Enterprise SMS (eSMS) is under development and targeting BUILDER capabilities in the next few years

- Current BUILDER is a SOAP based API
- Enterprise SMS is REST based API



# Demonstration / Working Session

- <https://buildersummit.com/resources/>
- API Connector Tool
  - Unzip to Desktop
  - Change Server URL
  - Change User Email / Password
- API Connector Source Available to Download
- Connect to a Server
- Sample Playground  
URL: <https://demo.buildersoftware.net>  
User: [info@digonsystems.com](mailto:info@digonsystems.com)  
Password: Pass4API



# Lessons Learned

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- Section equipment grouping is not common in CMMS
- Understand the data ownership relationships
- Bring in Information Assurance / Cyber Security early
- Work items often are re-generated
- Test performance early with large datasets



Thank You

Next Summit Summer @ San Antonio  
February 12-14, 2020

Please send feedback and future discussions to:  
[kurt@digonsystems.com](mailto:kurt@digonsystems.com)





Thank you for  
attending!